



Chelsea PTO 277/278 Parts Manual

Pro Gear Chelsea 277/278 Series PTO parts manual to assist in identifying the parts for your Chelsea Power Take Off unit.

If you need any assistance identifying the correct Power Take Off unit for your truck and equipment, contact your Chelsea replacement part specialists at Pro Gear and Transmission.

Pro Gear stocks every part for your Parker Chelsea PTO including: PTO housings, mounts, driveshafts, gears, bearings, gaskets, cable shift cover assembly, post and plate assembly, brackets, stud kits, seal kits, lever control assembly, air shift cover assembly, direct mount pump conversion kits, stud kits including English and metric references, CAT D&H parts and much more.

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CHELSEA[®]

Parts List

277/278 Series

Effective: April 1, 2016
Supersedes: HY25-2277-M1/US
Dated August 15, 2015

Bulletin HY25-2277-M1/US



 **WARNING**

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application and review the information concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

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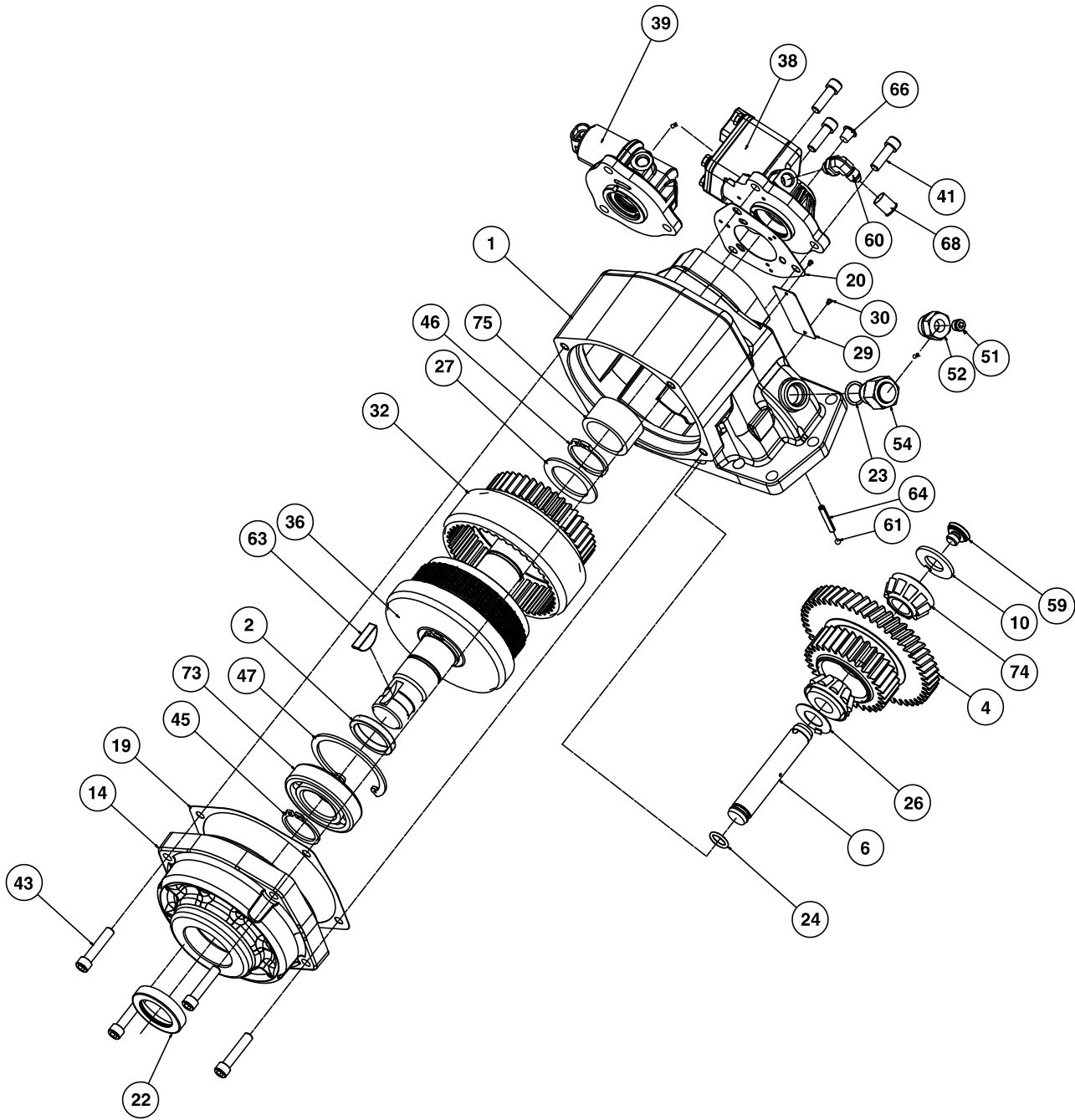
Offer of Sale

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Item	Part Number	Description	Quantity
1	1-P-603	PTO Housing "5" Ass'y	1 or
	1-P-690	PTO Housing "3" Ass'y	1
2	4-P-147	Spacer, Drive Shaft.....	1
	4-P-187	Spacer, Drive Shaft ("ZY" Output).....	1 or
4	See Page 4	Input Gear.....	1
6	9-P-91	Idler Shaft	1
10	14-P-79-1	Tabbed Washer (.112" - .114").....	A.R.
	14-P-79-2	Tabbed Washer (.116" - .118").....	A.R.
	14-P-79-3	Tabbed Washer (.120" - .122").....	A.R.
	14-P-79-4	Tabbed Washer (.124" - .126").....	A.R.
14	See Below	Bearing Cover (open)	1
	21-P-480	Bearing Cover ("XD" Output)	1
	21-P-691	Bearing Cover "BA" Only ("BA" Output)	1
	See Pages 16-21	Bearing Cover (All Other Outputs).....	1
19	22-P-101	Gasket Bearing Cap ("BA" Output)	2 or
	22-P-101	Gasket Bearing Cap (All other Outputs)	1
20	22-P-112	Gasket, Valve Cap	1
22	See Below	Oil Seal	1
	28-P-225	Oil Seal (Output Side) ("XD" Output)	1
	See Pages 16-21	Oil Seal (Output Side) (All Other Outputs).....	1
23	28-P-171	O-Ring (With EOC Only) (-908).....	1
24	28-P-191	O-Ring (-113).....	1
26	31-P-102	Thrust Washer	1
27	31-P-70	Thrust Washer	1
29	68-P-2	Name Plate.....	1
30	378422	Drive Screw	2
32	See Page 4	Output Gear Sub Assembly.....	1
N.S.	560972	Bearing.....	1
N.S.	329252X	Seal Cap Assembly (Hino Mount Only)	1 or
	329403X	Seal Cap Assembly ("G" & "H" Shift Only)	1
36	See Below	Drive Shaft & Clutch Ass'y.....	1
	329720-1X	Drive Shaft & Clutch Ass'y (3-P-1049) ("XD" Output).....	1
	329720-10X	Drive Shaft & Clutch Ass'y (3-P-1057) ("BA" Output)	1
	See Page 5	Drive Shaft & Clutch Ass'y (All Other Outputs).....	1
38	See Page 13	Valve & Valve Cap Assembly (12V) "Old Style" ("FJ" Pitch Only)	1 or
	329352-12X	Valve & Valve Cap Assembly (24V) "Old Style" ("FJ" Pitch Only)	1
	329352-24X		
39	329442-12X	Valve & Valve Cap Assembly (12V) ("KV" Pitch Only)	1 or
	329442-24X	Valve & Valve Cap Assembly (24V) ("KV" Pitch Only)	1
	329463-12X	Valve & Valve Cap Assembly (12V)	1 or
	329463-24X	Valve & Valve Cap Assembly (24V)	1
		HEX. CAPSCREW	
41	378447-6	Soc. HD. Capscrew .312" - 18 x 1.00"	3
43	378447-16	Soc. HD. Capscrew .312" - 18 x 3.50" ("BA" Output)	4 or

A.R. — As Required N.S. — Not Shown

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Item	Part Number	Description	Quantity
	378447-8	Soc. HD. Capscrew .312" - 18 x 1.50" (All other Outputs).....	4
45	378576	Retaining Ring ("BA" Output).....	2 or
	379555	Retaining Ring ("ZY" Output).....	1 or
	378576	Retaining Ring (All Other Outputs).....	1
46	379746	Retaining Ring.....	1
47	378895	Retaining Ring (All other Outputs).....	1 or
	378263	Retaining Ring ("ZY" Output).....	1
51	379231	Pipe Plug .125" - 27 NPTF (w/o EOC Only).....	1
52	379242	O-Ring Boss Plug (w/o EOC Only).....	1
54	379243	Speed Sensor (With EOC Only).....	1
59	379672	NWD Plug.....	1
60	379486	Straight Thread Connector 90° (All other Outputs).....	1 or
	379556	Straight Thread O-Ring Run Tee ("ZY" Output).....	1
61	378108	Ball.....	1
63	500007-29	Woodruff Key ("XD" Output Only).....	1
64	500597-16	Spring Pin.....	1
66	500897-5	Shipping Plug.....	1
68	379564-2	Shipping Cap (All Shift Options).....	1
73	550010	Ball Bearing (All Other Outputs).....	1 or
	550311	Ball Bearing ("ZY" Output).....	1
74	550439	Tapered Bearing Cone.....	2
75	560972	Bearing Needle Roller Ass'y.....	1
N.S.	35-P-74	Gasket Shim PTO / Transmission.....	1
LOOSE PARTS			
	328748X	Pump Mounting Kit (For "XR" Output Only).....	1
	329277-1X	Complete Installation Kit 12V (less EOC) for "B" Shift Only. Shipped w/Unit.....	1
	7170-86X	Mounting Kit ("FJ" Gear Pitch).....	1
	328948-9X	Gasket & Installation Instructions.....	1
INSTALLATION KITS			
	See Below		
	329237-12X	Installation Kit 12V Remote Valve w/o EOC.....	1
	329237-24X	Installation Kit 24V Remote Valve w/o EOC.....	1
	329024-12X	Installation Kit 12V (Less EOC).....	1
	329024-24X	Installation Kit 24V (Less EOC).....	1
	329076X	Installation Kit 12V & 24V (With EOC) (New Style).....	1
	329443-12X	Installation Kit 12V ("KV" Pitch Only).....	1
	329443-24X	Installation Kit 24V ("KV" Pitch Only).....	1
	329444X	Installation Kit 12V & 24V (With EOC) ("KV" Pitch Only) (New Style).....	1
	329445-12X	Installation Kit 12V Remote Valve ("KV" Pitch Only).....	1
	329445-24X	Installation Kit 24V Remote Valve ("KV" Pitch Only).....	1
	7170-117X	Mounting Kit (For "KV" Pitch Only).....	1
	328924-12X	Control Box 12V (With EOC) (Old Style).....	1 or
	328924-24X	Control Box 24V (With EOC) (Old Style).....	1
	328388-85X	Airshift Installation Kit "S" Shift Option.....	1
	328388-86X	Airshift Installation Kit "T" Shift Option.....	1
	329441X	Pressure Switch Relocation Kit (Hino) (For "HINO" Mount).....	1
	329130-1X	Hose Assembly (For "HINO" Mount Only).....	1
	329057-4X	Hose Assembly ("G" & "H" Shift Only).....	2
	328075X	Hose Assembly ("G" & "H" Shift Only).....	1
	329650X	Control Box 12V / 24V (With EOC).....	1

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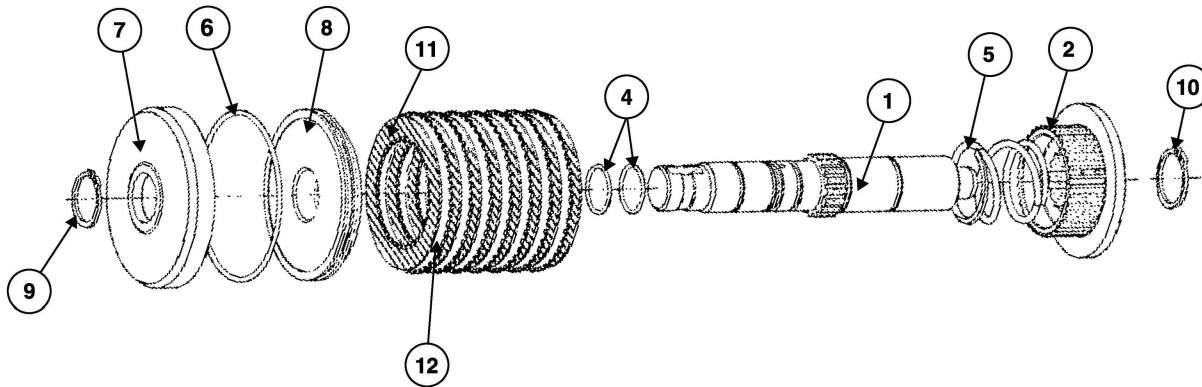
Item	Part Number	Description	Quantity
		SERVICE KITS	
	329071-19X	Gasket & Seal Kit (All Other Outputs)	
	329071-33X	Gasket & Seal Kit (For "XY" Output Only)	
	329071-36X	Bearing Kit (All Other Outputs)	
	329071-43X	Gasket & Seal Kit ("ZY" Output)	
	329071-44X	Bearing Kit ("ZY" Output)	
	329071-45X	Clutch Repair Kit ("ZY" Output)	
	329071-7X	Clutch Repair Kit (All Other Outputs)	
	329175-12X	EOC Field Conversion Kit 12V (Old Style)	
	329175-24X	EOC Field Conversion Kit 24V (Old Style)	
	329354-12X	Conversion Kit 12V Remote Mount Valve	
	329354-24X	Conversion Kit 24V Remote Mount Valve	
	329160-59X	Conversion Kit "XD" to "BA"	
	329043-21X	Service Kit "BA" Brake Section Only	
	329071-35X	Gasket & Seal Kit, "BA"	
	329447-12X	Kit Remote Valve Conversion 12V ("KV" Pitch Only) (Old Style)	
	329447-24X	Kit Remote Valve Conversion 24V ("KV" Pitch Only) (Old Style)	
	329448-12X	Kit EOC Field Conversion 12V ("KV" Pitch Only) (Old Style)	
	329448-24X	Kit EOC Field Conversion 24V ("KV" Pitch Only) (Old Style)	
		ARCHIVE KITS	
	329240-12X	Conversion Kit 12V Remote Mount Valve (Units with Lube Tube)	
	329240-24X	Conversion Kit 24V Remote Mount Valve (Units with Lube Tube)	

277 Gear Chart

Model Number	Input Gear Part Number Item No. 4	Number Teeth Lg/Sm	Output Gear Item No. 32		Gear & Bearing* Sub-assembly Items 32
			Part Number	Number Teeth	
277XBFJ	5-P-912	50/25	2-P-688	47	329005-1X
277XDFJ	5-P-913	50/28	2-P-684	44	329005-2X
277XGFJ	5-P-914	50/31	2-P-683	41	329005-3X
277XMFJ	5-P-915	50/35	2-P-682	37	329005-4X
277XSFJ	5-P-1173	50/39	2-P-756	33	329005-5X
SUPER TORQUE™					
277SBFJ	5-P-1350	50/25	2-P-800	47	329005-6X
277SDFJ	5-P-1293	50/28	2-P-790	44	329005-7X
277SGFJ	5-P-1225	50/31	2-P-779	41	329005-8X
277SMFJ	5-P-1351	50/35	2-P-801	37	329005-9X
277SSFJ	5-P-1278	50/39	2-P-789	33	329005-10X
277XBKV	5-P-1361	45/25	2-P-688	47	329005-1X
277XDKV	5-P-1362	45/28	2-P-684	44	329005-2X
277XGKV	5-P-1363	45/31	2-P-683	41	329005-3X
277XMKV	5-P-1367	45/35	2-P-682	37	329005-4X
277XSKV	5-P-1369	45/39	2-P-756	33	329005-5X
SUPER TORQUE™					
277SBKV	5-P-1402	45/25	2-P-800	47	329005-6X
277SDKV	5-P-1413	45/28	2-P-790	44	329005-7X
277SGKV	5-P-1414	45/31	2-P-779	41	329005-8X
277SMKV	5-P-1415	45/35	2-P-801	37	329005-9X
277SSKV	5-P-1416	45/39	2-P-789	33	329005-10X

*Bearing Part Number 560972

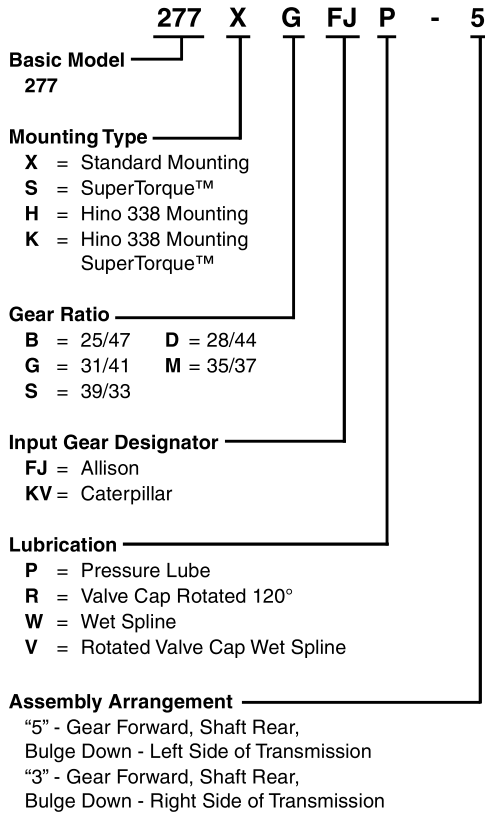
277 Series Output Shafts & Clutch Assembly Bill of Materials



Item	Part Number	Description	Quantity
1	329720-1X 3-P-1049	Assembly "XD" Output Drive Shaft "XD".....	1 or
1	329720-2X 3-P-1050	Assembly "XK" & "XP" Output Drive Shaft "XK" & "XP".....	1 or
1	329720-3X 3-P-1051	Assembly "PA", "RA", "RB", "RK" & "XR" Output Drive Shaft "PA", "RA", "RB", "RK" & "XR".....	1 or
1	329720-4X 3-P-1052	Assembly "XY" Output Drive Shaft "XY".....	1 or
1	329720-5X 3-P-1053	Assembly "XX" Output Drive Shaft "XX".....	1 or
1	329720-6X 3-P-1054	Assembly "AF" Output Drive Shaft "AF".....	1 or
1	329720-8X 3-P-1055	Assembly "XK", "XP" & "RM" Output Drive Shaft "XK", "XP" & "RM".....	1 or
1	329720-9X 3-P-1056	Assembly "XE" Output Drive Shaft "XE".....	1 or
1	329720-10X 3-P-1057	Assembly "BA" Output Drive Shaft "BA".....	1 or
1	329721X 3-P-1059	Assembly "ZY" Output Drive Shaft "ZY".....	1
2	2-P-858	Inner Clutch Gear.....	1
4	28-P-244	O-Ring.....	2
5	37-P-39	Clutch Spring.....	1
6	329179-1X 28-P-178	Piston & Backup Cyl. Sub. Assembly..... O-Ring.....	1 1
7	379323-1	Clutch Back-up Cylinder.....	1
8	380057-1	Clutch Piston.....	1
9	378576	Retaining Ring.....	1
10	380069	Retaining Ring.....	1
11	379485	Friction Disk.....	8
12	379595	Clutch Plate.....	7
"ZY" Output Only			
2	2-P-858	Inner Clutch Gear.....	1
4	28-P-285	O-Ring.....	2
5	37-P-62	Clutch Spring.....	1
6	28-P-178	O-Ring.....	1
7	380051	Clutch Back-Up Cylinder.....	1
8	380110X	Clutch Piston.....	1
9	379555	Retaining Ring.....	1
10	380069	Retaining Ring.....	1
11	379485	Friction Disk.....	8
12	379595	Clutch Plate.....	7

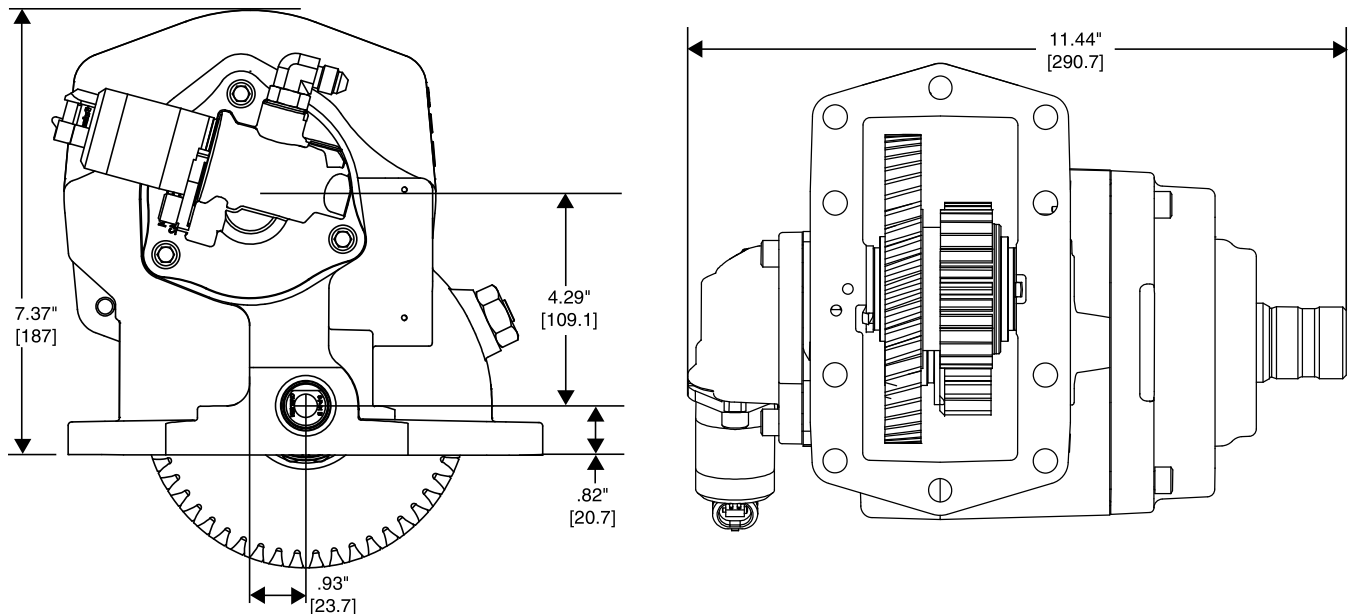
277 Model Number Designation

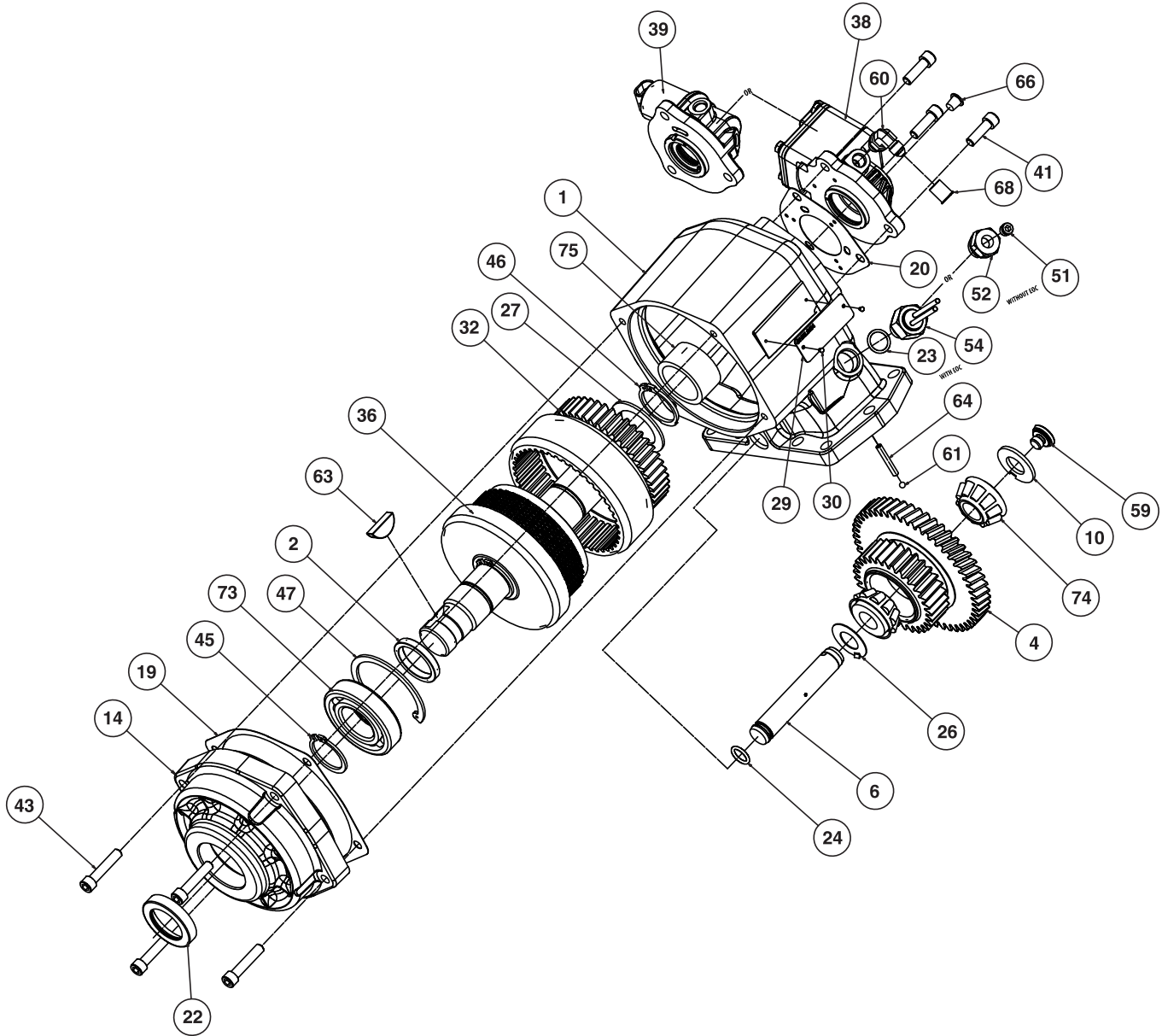
Model Number Designation



- Output Type**
- ¹ **AF** = SAE "B" 2 or 4-Bolt Flange, SAE "BB" Shaft (1" - 15T)
 - BA** = 1-1/4" Round Shaft w/ Brake (Automatic Transmission)
 - PA** = Rotatable SAE "B" 2-Bolt Flange, SAE "B" Shaft (7/8" - 13T)
 - PF** = Rotatable SAE "B" 2-Bolt Flange, SAE "BB" Shaft (1" - 15T)
 - XD** = Rd Standard Shaft (1-1/4" - 5/16" Key)
 - XE** = SAE "B" 2 or 4-Bolt Flange, SAE "A" Shaft (5/8" - 9T)
 - ¹ **XK** = SAE "B" 2 or 4-Bolt Flange, SAE "B" Shaft (7/8" - 13T)
 - XP** = Special SAE "A" Pilot 2-Bolt Flange, SAE "B" Shaft (7/8" - 13T)
 - ¹ **XR** = Chelsea Special (Cloverleaf), SAE "B" Shaft (7/8" - 13T)
 - XX** = 1-1/4" Tapered Output Shaft w/ Keyway
 - XV** = 1-3/8" - 10T Spline w/1410 Companion Flange
 - XY** = ISO 7653 Pump Mounting DIN 5462 Shaft
 - ¹ **ZY** = SAE "C" 4-Bolt Flange, SAE "C" Shaft (1-1/4" - 14T)
 - RF** = Rotatable SAE "B" 2-Bolt Flange, SAE "BB" Shaft (1" - 15T)
 - RG** = Rotatable SAE "BB" 4-Bolt 1" - 15
 - ¹ **RK** = Rotatable SAE "B" 2 or 4-Bolt Pump Mount, SAE "B" Shaft (7/8" - 13T)
 - ¹ **RM** = Rotatable SAE "B" 2/4-Bolt 1" - 15T
 - G220** = RB flange w/G102-1-2.0R-4S-AS Pump
- ¹ Can be ordered with or without Wetspline
- Shifter Type**
- B** = 12V Elec/Hyd
 - D** = 24V Elec/Hyd
 - ² **M** = 12V Elec/Hyd w/o Installation Kit
 - ² **N** = 24V Elec/Hyd w/o Installation Kit
 - K** = 12V Elec/Hyd w/ EOC
 - L** = 24V Elec/Hyd w/ EOC
 - G** = 12V Elec/Hyd Valve w/o EOC - Remote
 - H** = 24V Elec/Hyd Valve w/o EOC - Remote
 - ² **F** = No Valve
 - S** = Air Shift with PTO/Dump Pump Combo Valve w/ Kick Out w/ Neutral Spring Return
 - T** = Air Shift with PTO/Dump Pump Combo Valve w/o Kick Out w/ Neutral Spring Return
- ² Europe Only

PTO Housing Dimensions





Item	Part Number	Description	Quantity
1	1-P-591	PTO Housing	1
2	4-P-147 4-P-187	Spacer, Drive Shaft (All Other Outputs)..... Spacer, Drive Shaft ("ZY" Output).....	1 1
4	See Page 10	Input Gear.....	1
6	9-P-91	Idler Shaft	1
10	14-P-79-1 14-P-79-2 14-P-79-3 14-P-79-4	Tabbed Washer (.112" - .114")..... Tabbed Washer (.116" - .118") Tabbed Washer (.120" - .122") Tabbed Washer (.124" - .126")	A.R.
14	See Below 21-P-480 21-P-691 See Pages 16-21	Bearing Cover (open)..... Bearing Cover ("XD" Output) Bearing Cover ("BA" Output) Bearing Cover (All Other Outputs)	1
19	22-P-101 22-P-101	Gasket Bearing Cap ("BA" Output)..... Gasket Bearing Cap (All Other Outputs)	2 or 1
20	22-P-112	Gasket, Valve Cap	1
22	See Below 28-P-225 See Pages 16-21	Oil Seal..... Oil Seal (Output Side) ("XD" Output) Oil Seal	1
23	28-P-171	O-Ring (-908) (With EOC Only).....	1
24	28-P-191	O-Ring (-113).....	1
26	31-P-102	Thrust Washer	1
27	31-P-70	Thrust Washer	1
29	68-P-2	Name Plate.....	1
30	378422	Drive Screw	2
32	See Page 10	Output Gear Sub Assembly.....	1
34	329403X	Seal Cap Assembly ("G" & "H" Shift Only)	1
36	See Below 329720-1X 329720-10X See Page 11	Drive Shaft & Clutch Ass'y..... Drive Shaft & Clutch Ass'y (3-P-1049) ("XD" Output) Drive Shaft & Clutch Ass'y (3-P-1057) ("BA" Output) Drive Shaft & Clutch Ass'y (All Other Outputs)	1
38	See Page 13 329352-12X 329352-24X	Valve & Valve Cap Assembly (12V) "Old Style" ("FJ" Pitch Only)	1 or 1
39	329442-12X 329442-24X 329463-12X 329463-24X	Valve & Valve Cap Assembly (12V) ("KV" Pitch Only)	1 or 1 1 or 1
41	378447-6	Soc. HD. Capscrew .312" - 18 x 1.00"	3
43	378447-16 378447-8	Soc. HD. Capscrew .312" - 18 x 3.50" ("BA" Output)	4 or 4
45	378576 379555 378576	Retaining Ring ("BA" Output)..... Retaining Ring ("ZY" Output)..... Retaining Ring (All Other Outputs).....	2 or 1 or 1
46	379746	Retaining Ring.....	1
47	378263	Retaining Ring ("ZY" Output).....	1

A.R. — As Required N.S. — Not Shown

Continued on Next Page

Item	Part Number	Description	Quantity
	378895	Retaining Ring (All Other Outputs).....	1
51	379231	Pipe Plug .125" - 27 NPTF (w/o EOC Only).....	1
52	379242	O-Ring Boss Plug (w/o EOC Only)	
54	379243	Speed Sensor (With EOC Only).....	1
59	379672	NWD Plug.....	1
	379556	Straight Thread Connector 90°.....	1
60	379486	Straight Thread Connector 90° (All Other Outputs).....	1
61	378108	Ball.....	1
63	500007-29	Woodruff Key ("XD" Output Only).....	1
64	500597-16	Spring Pin.....	1
66	500897-3	Shipping Plug.....	1
68	379564-2	Shipping Cap.....	1
	550311	Ball Bearing.....	1
73	550010	Ball Bearing (All Other Outputs).....	1
74	550439	Tapered Bearing Cone.....	2
75	560972	Needle Bearing.....	1
		LOOSE PARTS	
	328748X	Pump Mounting Kit (For "XR" Output Only).....	1
	7170-107X	Mounting Kit.....	1
	328948-9X	Gasket & Installation Instructions.....	1
	7170-118X	Mounting Kit ("KV" Pitch Only)	
	See Below	INSTALLATION KIT	
	329024-12X	Installation Kit 12V (Less EOC).....	1
	329024-24X	Installation Kit 24V (Less EOC).....	1
	329076X	Installation Kit 12V & 24V (With EOC) (New Style).....	1
	328388-85X	Airshift Installation Kit "S" Shift.....	1
	328388-86X	Airshift Installation Kit "T" Shift.....	1
	329443-12X	Installation Kit 12V (For "KV" Pitch Only).....	1
	329443-24X	Installation Kit 24V (For "KV" Pitch Only).....	1
	329444X	Installation Kit 12V and 24V with EOC (For "KV" Pitch Only).....	1
	329445-12X	Installation Kit 12V Remote Valve (For "KV" Pitch Only).....	1
	329445-24X	Installation Kit 24V Remote Valve (For "KV" Pitch Only).....	1
	329650X	Control Box 12V/24V (With EOC) (New Style).....	1
	329237-12X	Installation Kit Remote Valve option w/o EOC.....	1 or
	329237-24X	Installation Kit Remote Valve option w/o EOC.....	1
	329057-4X	Hose Assembly ("G" & "H" Shift Only).....	1
	328075X	Hose Assembly ("G" & "H" Shift Only).....	1
		SERVICE KITS	
	329071-19X	Gasket & Seal Kit (All Other Outputs)	
	329071-33X	Gasket & Seal Kit (For "XY" Output Only)	
	329071-43X	Gasket & Seal Kit (For "ZY" Output Only)	
	329071-36X	Bearing Kit (All Other Outputs)	
	329071-7X	Clutch Repair Kit (All Other Outputs)	
	329071-44X	Bearing Kit ("ZY" Output Only)	
	329071-45X	Clutch Repair Kit ("ZY" Output Only)	
	329175-12X	EOC Field Conversion Kit 12V (Old Style)	
	329175-24X	EOC Field Conversion Kit 24V (Old Style)	

A.R. — As Required N.S. — Not Shown

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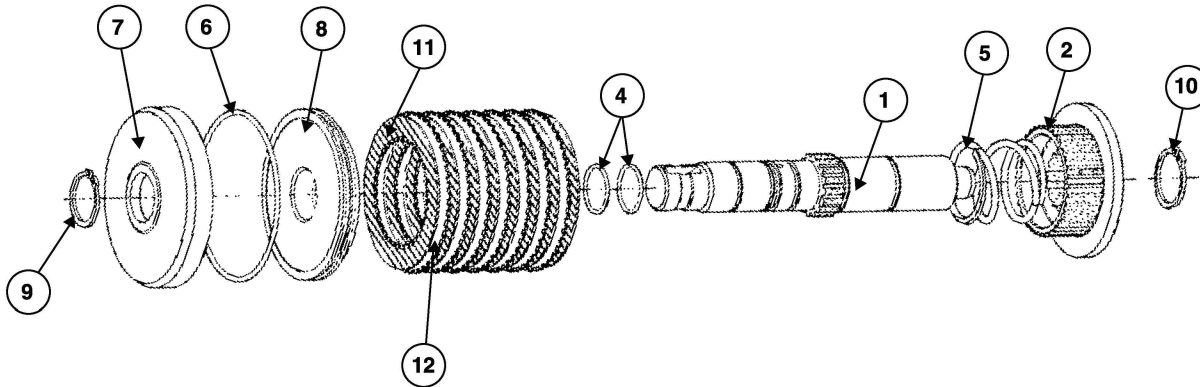
Item	Part Number	Description	Quantity
		Service Kits (Continued)	
	329160-59X	Conversion Kit "XD" to "BA"	
	329043-21X	Service Kit "BA" Brake Section Only	
	329071-35X	Gasket & Seal Kit "BA"	
	329354-12X	12V Remote Mount Valve Conversion Kit	
	329354-24X	24V Remote Mount Valve Conversion Kit	
	329447-12X	Kit 12V Remote Valve Conversion (For "KV" Pitch Only)	
	329447-24X	Kit 24V Remote Valve Conversion (For "KV" Pitch Only)	
	329448-12X	Kit 12V EOC Field Conversion (For "KV" Pitch Only)	
	329448-24X	Kit 24V EOC Field Conversion (For "KV" Pitch Only)	

278 Gear Chart

Model Number	Input Gear Part Number Item No. 4	Number Teeth Lg/Sm	Output Gear Item No. 32		Gear & Bearing* Sub-assembly Items 32
			Part Number	Number Teeth	
278XBFJ	5-P-912	50/25	2-P-811	50	329005-11X
278XDFJ	5-P-913	50/28	2-P-688	47	329005-1X
278XGFJ	5-P-914	50/31	2-P-684	44	329005-2X
278XMFJ	5-P-915	50/35	2-P-814	40	329005-13X
278XSFJ	5-P-1173	50/39	2-P-815	36	329005-14X
278XTFJ	5-P-1409	50/42	2-P-756	33	329005-5X
SUPER TORQUE™					
278SBFJ	5-P-1350	50/25	2-P-812	50	329005-12X
278SDFJ	5-P-1293	50/28	2-P-800	47	329005-6X
278SGFJ	5-P-1225	50/31	2-P-790	44	329005-7X
278SMFJ	5-P-1351	50/35	2-P-816	40	329005-15X
278SSFJ	5-P-1278	50/39	2-P-817	36	329005-16X
278STFJ	5-P-1410	50/42	2-P-789	33	329005-10X
278XBKV	5-P-1361	45/25	2-P-811	50	329005-11X
278XDKV	5-P-1362	45/28	2-P-688	47	329005-1X
278XGKV	5-P-1363	45/31	2-P-684	44	329005-2X
278XMKV	5-P-1367	45/35	2-P-814	40	329005-13X
278XSKV	5-P-1369	45/39	2-P-815	36	329005-14X
SUPER TORQUE™					
278SBKV	5-P-1402	45/25	2-P-812	50	329005-12X
278SDKV	5-P-1413	45/28	2-P-800	47	329005-6X
278SGKV	5-P-1414	45/31	2-P-790	44	329005-7X
278SMKV	5-P-1415	45/35	2-P-816	40	329005-15X
278SSKV	5-P-1416	45/39	2-P-817	36	329005-16X

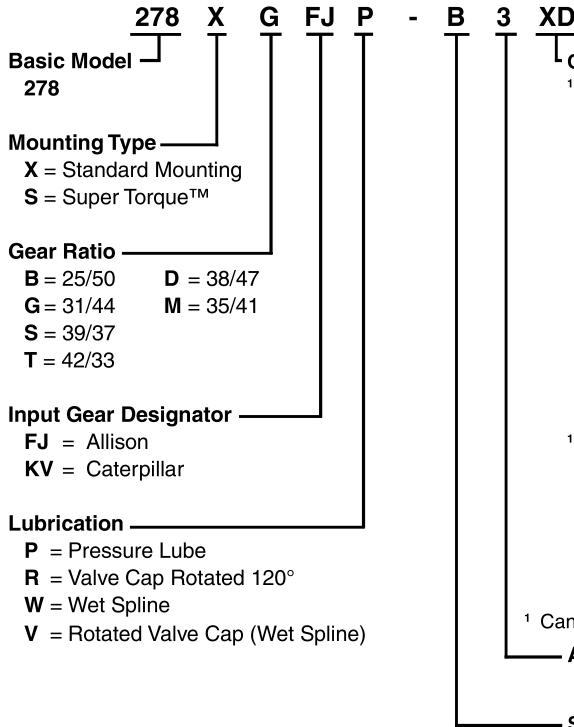
*Bearing Part Number 560972

278 Series Output Shafts & Clutch Assembly Bill of Materials



Item	Part Number	Description	Quantity
1	329720-1X 3-P-1049	Assembly "XD" Output Drive Shaft "XD".....	1 or
1	329720-2X 3-P-1050	Assembly "XK" & "XP" Output Drive Shaft "XK" & "XP".....	1 or
1	329720-3X 3-P-1051	Assembly "PA", "RA", "RB", "RK" & "XR" Output Drive Shaft "PA", "RA", "RB", "RK" & "XR".....	1 or
1	329720-4X 3-P-1052	Assembly "XY" Output Drive Shaft "XY".....	1 or
1	329720-5X 3-P-1053	Assembly "XX" Output Drive Shaft "XX".....	1 or
1	329720-6X 3-P-1054	Assembly "AF" Output Drive Shaft "AF".....	1 or
1	329720-8X 3-P-1055	Assembly "XK", "XP" & "RM" Output Drive Shaft "XK", "XP" & "RM".....	1 or
1	329720-9X 3-P-1056	Assembly "XE" Output Drive Shaft "XE".....	1 or
1	329720-10X 3-P-1057	Assembly "BA" Output Drive Shaft "BA".....	1 or
1	329721X 3-P-1059	Assembly "ZY" Output Drive Shaft "ZY".....	1
2	2-P-858	Inner Clutch Gear.....	1
4	28-P-244	O-Ring.....	2
5	37-P-39	Clutch Spring.....	1
6	329179-1X 28-P-178	Piston & Backup Cyl. Sub. Assembly..... O-Ring.....	1 1
7	379323-1	Clutch Back-up Cylinder.....	1
8	379325-1	Clutch Piston.....	1
9	378576	Retaining Ring.....	1
10	380069	Retaining Ring.....	1
11	379485	Friction Disk.....	8
12	379595	Clutch Plate.....	7
2	3-P-999	"ZY" Output Only Drive Shaft.....	1
4	28-P-285	O-Ring.....	2
5	37-P-62	Clutch Spring.....	1
6	28-P-178	O-Ring.....	1
7	380051	Clutch Back-Up Cylinder.....	1
8	380110X	Clutch Piston.....	1
9	379555	Retaining Ring.....	1
10	380069	Retaining Ring.....	1
11	379485	Friction Disk.....	8
12	379595	Clutch Plate.....	7

Model Number Designation



Basic Model
278

Mounting Type
X = Standard Mounting
S = Super Torque™

Gear Ratio
B = 25/50 D = 38/47
G = 31/44 M = 35/41
S = 39/37
T = 42/33

Input Gear Designator
FJ = Allison
KV = Caterpillar

Lubrication
P = Pressure Lube
R = Valve Cap Rotated 120°
W = Wet Spline
V = Rotated Valve Cap (Wet Spline)

Output Type

- ¹ AF = SAE "B" 2 or 4-Bolt Flange, SAE "BB" Shaft (1" - 15T)
- BA = 1-1/4" Round Shaft w/ Brake (Automatic Transmission)
- PA = Rotatable SAE "B" 2-Bolt Flange, SAE "B" Shaft (7/8" - 13T)
- PF = Rotatable SAE "B" 2-Bolt Flange, SAE "BB" Shaft (1" - 15T)
- XD = Rd Standard Shaft (1-1/4" - 5/16" Key)
- XE = SAE "B" 2 or 4-Bolt Flange, SAE "A" Shaft (5/8" - 9T)
- ¹ XK = SAE "B" 2 or 4-Bolt Flange, SAE "B" Shaft (7/8" - 13T)
- XP = Special SAE "A" Pilot 2-Bolt Flange, SAE "B" Shaft (7/8" - 13T)
- XR = Chelsea Special (Cloverleaf), SAE "B" Shaft (7/8" - 13T)
- ¹ XX = 1-1/4" Tapered Output Shaft w/ Keyway
- XV = 1-3/8" - 10T Spline w/1410 Companion Flange
- XY = ISO 7653 Pump Mounting DIN 5462 Shaft
- ¹ ZY = SAE "C" 4-Bolt Flange, SAE "C" Shaft (1-1/4" - 14T)
- RA = Rotatable SAE "B" 2-Bolt Flange, SAE "B" Shaft (7/8" - 13T)
- RF = Rotatable SAE "B" 2-Bolt Flange, SAE "BB" Shaft (1" - 15T)
- RB = Rotatable SAE "B" 4-Bolt Flange, SAE "B" Shaft (7/8" - 13T)
- RG = Rotatable SAE "BB" 4-Bolt 1" - 15
- ¹ RK = Rotatable SAE "B" 2 or 4-Bolt Pump Mount, SAE "B" Shaft (7/8" - 13T)
- ¹ RM = Rotatable SAE "B" 2/4-Bolt 1.0" - 15T
- G220 = RB Flange w/G102-1-2.0R-4S-AS Pump

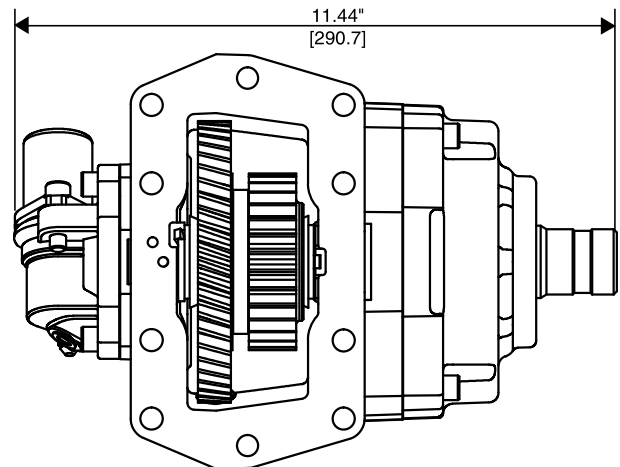
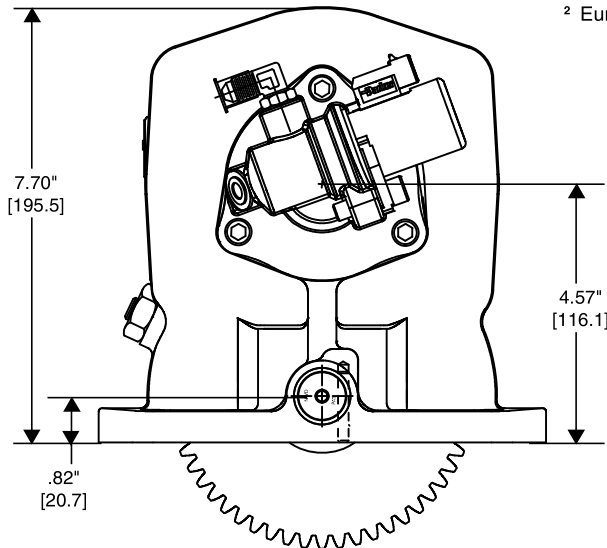
Assembly Arrangement

3 - Gear Forward, Shaft Rear, Output Shaft Centerline of PTO

Shifter Type

- B = 12V Elec/Hyd
- D = 24V Elec/Hyd
- ² M = 12V Elec/Hyd w/o Installation Kit
- ² N = 24V Elec/Hyd w/o Installation Kit
- K = 12V Elec/Hyd w/ EOC
- L = 24V Elec/Hyd w/ EOC
- G = 12V Elec/Hyd Valve w/o EOC - Remote
- H = 24V Elec/Hyd Valve w/o EOC - Remote
- ² F = No Valve
- S = Air Shift with PTO/Dump Pump Combo Valve w/ Kick Out w/ Neutral Spring Return
- T = Air Shift with PTO/Dump Pump Combo Valve w/o Kick Out w/ Neutral Spring Return

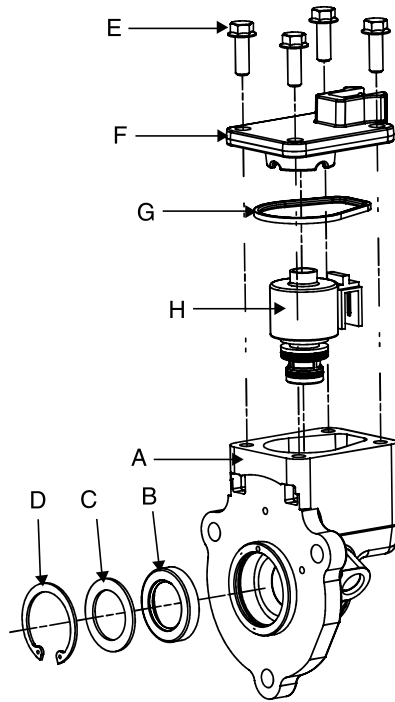
PTO Housing Dimensions



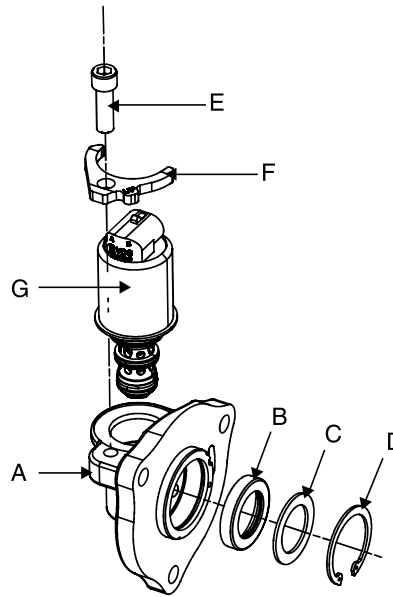
² Europe Only

Valve & Cap Bill of Materials

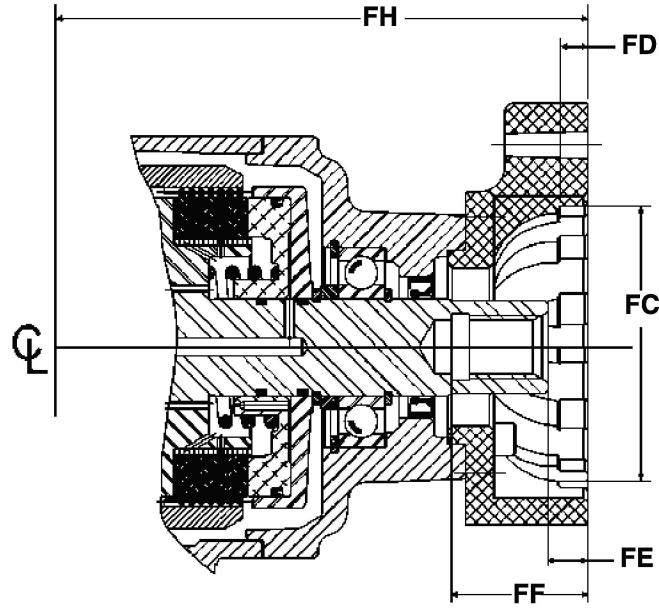
329352



329442 & 329463



Item	Part Number	Description	Quantity
38	329352-12X	Valve & Cap Assembly (12V).....	1 or
	329352-24X	Valve & Cap Assembly (24V).....	1
A	34-P-278	Valve Cap	1
B	28-P-119	Oil Seal (Hi Pressure).....	1
C	378811	Washer	1
D	378849	Retaining Ring.....	1
E	379565	Hexhead Capscrew .250" - 20 x .750".....	4
F	329144X	Valve Cap Cover (12V).....	1 or
	329144-1X	Valve Cap Cover (24V).....	1
G	28-P-193	Block Ring	1
H	379604-1	Hydraulic Valve (12V).....	1 or
	379604-2	Hydraulic Valve (24V).....	1
39	329442-12X	Valve & Cap Assembly (12V) ("KV" Pitch Only).....	1 or
	329442-24X	Valve & Cap Assembly (24V) ("KV" Pitch Only).....	1
	329463-12X	Valve & Cap Assembly (12V) ("FJ" Pitch Only).....	1 or
	329463-24X	Valve & Cap Assembly (24V) ("FJ" Pitch Only).....	1
A	34-P-143	Valve Cap	1
B	28-P-119	Oil Seal (Hi Pressure).....	1
C	378811	Washer	1
D	378849	Retaining Ring.....	1
E	378447-6	Sockethead Capscrew .312" - 18 x 1.00".....	1
F	379995	Clamp ("KV") Included with 379993 Valve	1 or
	380012	Clamp ("FJ") used with 380011 Valve.....	1
	380124	Clamp ("FJ") used with 380123 Valve.....	1
G	379993-12	Hydraulic Valve (12V) ("KV") (White Connector).....	1 or
	379993-24	Hydraulic Valve (24V) ("KV") (Black Connector).....	1
	380011-12	Hydraulic Valve (12V) ("FJ") (White Side Connector).....	1 or
	380011-24	Hydraulic Valve (24V) ("FJ") (Black Side Connector).....	1
	380123-12	Hydraulic Valve (12V) ("FJ") (White Connector Top) (New Style).....	1 or
	380123-24	Hydraulic Valve (24V) ("FJ") (Black Connector Top) (New Style).....	1



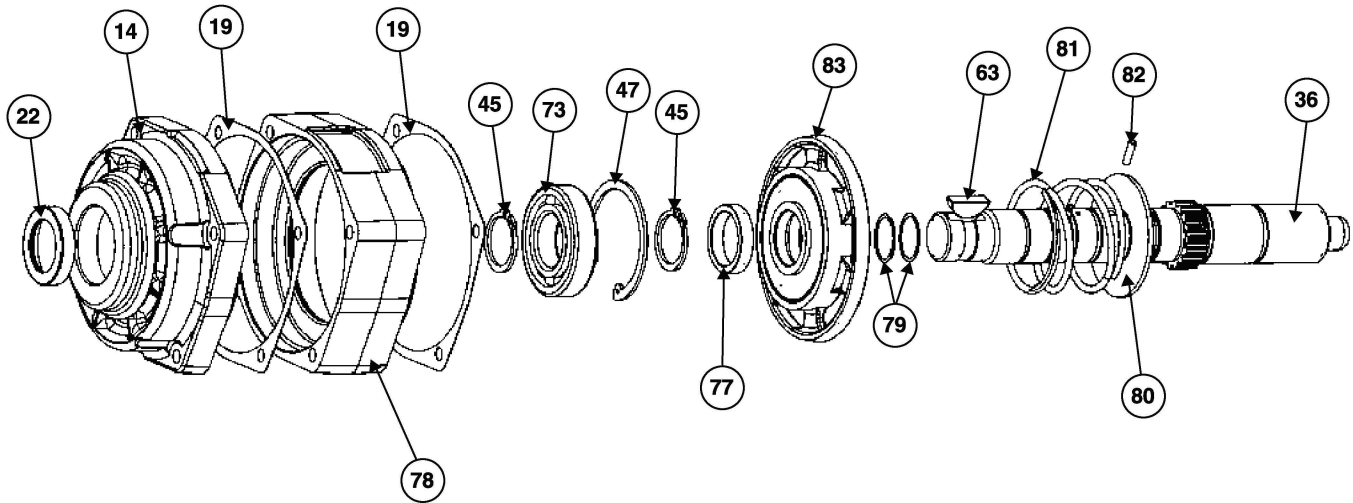
277/278 Series

Pump Flange Suffix	Bolt Circle Diameter	Bolt Holes		FC	FD	FE	FF	FH	Output Shaft	
		Hole Diameter	No. Equally Spaced	Female Pilot of Flange	Pilot Depth Hole	Face to End of PTO	Face Thru	Face to Center	Hole Diameter	Keyway Width
AF	5.000" 5.750"	.500" - 13T .500" - 13T	4 2	4.003"	0.406"	2.060"	7.304"		1" - 15T Spline	
BA	-	-	-	-	-	-	-	9.045"	1-1/4" Round .3125"	
XK	5.000" 5.750"	.500" - 13T .500" - 13T	4 2	4.003"	0.406"	0.562"	1.940"	6.410"	7/8" - 13T Spline	
XP	4.188"	.375" - 16T+	2	3.253"	0.344"	0.562"	1.940"	6.410"	7/8" - 13T Spline	
XR	3.710"	.312" - 18T+	4	2.752"	0.281"	N/A	N/A	5.860"	7/8" - 13T Spline	
XY	3.150"	M12 x 1.75"	4	3.152"	0.394"	0.550"	2.250"	9.030"	1-21/50" - 8T Spline	
XX*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1-1/4" SAE Taper .3125"	
RA ♦	5.750"	4 x .500" - 13T	4	4.003"	0.406"	0.574"	2.056"	7.605"	7/8" - 13T Spline	
RF ♦	5.750"	4 x .500" - 13T	2●	4.003"	0.406"	0.574"	2.056"	7.605"	1" - 15T Spline	
RG ♦	3.552"	4 x .500" - 13T	4	4.003"	0.406"	0.574"	2.060"	7.610"	1" - 15T Spline	
RB ♦	3.552"	4 x .500" - 13T	4	4.003"	0.406"	0.574"	2.060"	7.610"	7/8" - 13T Spline	
PF ♦	5.750"	4 x .500" - 13T	4	4.003"	0.406"	0.574"	2.056"	7.605"	1" - 15T Spline	
PA ♦	5.750"	4 x .500" - 13T	4	4.003"	0.406"	0.574"	2.056"	7.605"	7/8" - 13T Spline	
XE	4.188"	6 x .375" - 16T+	6	3.253"	0.344"	0.400"	1.501"	6.410"	7/8" - 13T Spline	
RK	5.750"	4 x .500" - 13T	2●	4.003"	0.406"	0.730"	2.700"	7.605"	7/8" - 13T Spline	
	5.000"	4 x .500" - 13T	4							
RM	5.750"	4 x .500" - 13T	2●	4.003"	0.406"	0.730"	2.700"	7.605"	1" - 15T Spline	
	5.000"	4 x .500" - 13T	4							
ZY	3.150"	M12 x 1.75"	4	3.152"	-	0.550"	2.250"	6.260"	1-21/50" - 8T Spline	

- * Requires customer supplied companion flange, Spicer part number 3-1-604.
- ♦ Rotatable Flange Rotates in 30° Increments
- Flange has two sets of holes offset 14°
- ◆ Hole tapped .750" deep

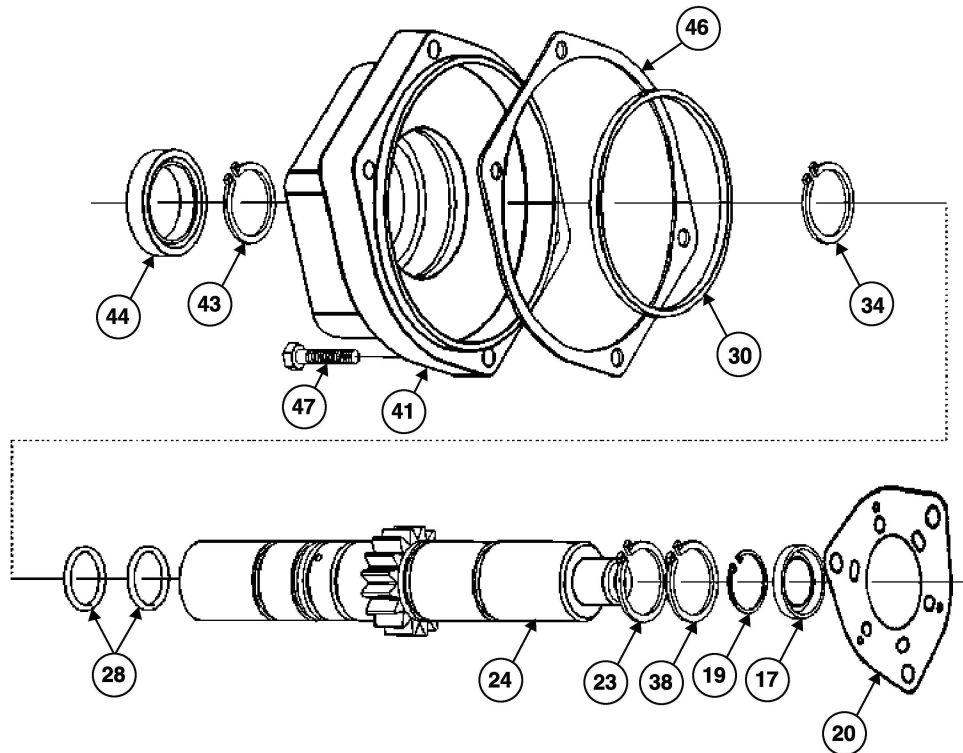
CAUTION: All pump mounting dimensions shown are compiled to conform to SAE standards; however it shall be the responsibility of the user to determine the correct fit at the time the pump is mounted to the PTO. Therefore carefully check the shaft and key or spline engagement.

NOTE: Apply a generous amount of spline lubricant part number 379688 to the inside of shaft. Must cover tooth space.



Item	Part Number	Description	Quantity
	329006-10X	Drive Shaft & Clutch Ass'y ("BA" Output) 277/278 Series	1
14	21-P-691	Bearing Cover "BA" Only ("BA" Output)	
19	22-P-101	Gasket Bearing Cap ("BA" Output)	2
22	28-P-225	Oil Seal (Output Side).....	1
36	3-P-985	Output Shaft	1
45	378576	Retaining Ring ("BA" Output).....	3
47	378895	Retaining Ring.....	1
63	500007-29	Woodruff Key	1
73	550010	Ball Bearing	1
77	4-P-186	Spacer, Drive Shaft.....	1
78	23-P-68	Spacer ("BA" Output Parts)	1
79	28-P-244	O-Ring	2
80	31-P-113	Thrust Washer ("BA" Output Parts).....	1
81	37-P-60	Spring ("BA" Output Parts)	1
82	379977	Pin .187" x .625" ("BA" Output Parts)	1
83	329410X	Brake Assembly ("BA" Output Parts).....	1

Pump Flange Conv. Kits Bills of Materials



Conversion Kit Number	Ass'y 277/278	Flange Type	Shaft Type
329160-21X XD-XK	5/3	SAE "B" 2 or 4-Bolt Flange	SAE "B" 7/8" - 13 Tooth
329160-22X XD-XR	5/3	For Parker P16 "S" Flange Pumps	SAE "B" 7/8" - 13 Tooth
329160-23X XD-XP	5/3	SAE "A" 2-Bolt (4.188 BC) w/ SAE "B" 4-Bolt (5.0" BC)	SAE "B" 7/8" - 13 Tooth
329160-24X XD-XY	5/3	SAE "B" 2 or 4-Bolt Flange	SAE "B" 7/8" - 13 Tooth
329160-25X XD-AF	5/3	SAE "B" 2 or 4-Bolt Flange	SAE "BB" 1" - 15 Tooth
329160-35X XR-RA	5/3	SAE "B" 2-Bolt Rotatable Flange	SAE "B" 7/8" - 13 Tooth
329160-36X XR-RB	5/3	SAE "B" 4-Bolt Rotatable Flange	SAE "B" 7/8" - 13 Tooth
329160-37X XD-RA	5/3	SAE "B" 2-Bolt Rotatable Flange	SAE "B" 7/8" - 13 Tooth
329160-38X XD-RB	5/3	SAE "B" 4-Bolt Rotatable Flange	SAE "B" 7/8" - 13 Tooth
329160-39X XD-RF	5/3	SAE "B" 2-Bolt Rotatable Flange	SAE "BB" 1" - 15 Tooth
329160-45X XD-RG	5/3	SAE "B" 4-Bolt Rotatable Flange	SAE "BB" 1" - 15 Tooth
329160-56X XD-PF	5/3	SAE "B" 2-Bolt Rotatable Flange w/Thru Holes	SAE "BB" 1" - 15 Tooth
329160-57X XD-PA	5/3	SAE "B" 2-Bolt Rotatable Flange w/Thru Holes	SAE "B" 7/8" - 13 Tooth
329160-58X XD-XE	5/3	SAE "A" 2-Bolt Flange	SAE "A" 5/8" - 9 Tooth
329160-59X XD-BA	5/3	Shaft Brake	1-1/4" Rd Shaft w/Shaft Brake
329160-66X XD-RK	5/3	SAE "B" 2 or 4-Bolt Rotatable Flange	SAE "B" 7/8" - 13 Tooth
329160-67X RK(Dry)-RK(Wet)	5/3	SAE "B" 2 or 4-Bolt Rotatable Flange	SAE "B" 7/8" - 13 Tooth
329160-68X XD-RK(Wet)	5/3	SAE "B" 2 or 4-Bolt Rotatable Flange	SAE "B" 7/8" - 13 Tooth
329160-69X RA/RB(Dry)-RK(Wet)	5/3	SAE "B" 2 or 4-Bolt Rotatable Flange	SAE "B" 7/8" - 13 Tooth
329160-70X RA/RB(Dry)-RK(Dry)	5/3	SAE "B" 2 or 4-Bolt Rotatable Flange	SAE "B" 7/8" - 13 Tooth
329160-71X XD-RM(Dry)	5/3	SAE "B" 2 or 4-Bolt Rotatable Flange	SAE "BB" 1" - 15 Tooth
329160-72X XD-RM(Wet)	5/3	SAE "B" 2 or 4-Bolt Rotatable Flange	SAE "BB" 1" - 15 Tooth
329160-73X RA/RB-RM(Dry)	5/3	SAE "B" 2 or 4-Bolt Rotatable Flange	SAE "BB" 1" - 15 Tooth

Pump Flange Conv. Kits Bills of Materials

Item	Part Number	Description	Quantity
	329160-21X	Conversion Kit (XD-XK)	
17	28-P-119	Oil Seal, High Pressure	1
19	378849	Retaining Ring.....	1
20	22-P-112	Gasket, Valve Cap	1
23	379746	Retaining Ring.....	1
24	3-P-832	Output Shaft	1
28	28-P-244	O-Ring	2
30	28-P-121	Block -v- Ring	1
34	378576	Retaining Ring.....	1
38	379746	Retaining Ring.....	1
41	21-P-482	Bearing Cap	1
43	378576	Retaining Ring.....	1
44	28-P-225	Oil Seal	1
46	22-P-101	Gasket, Bearing Cap	1
47	378447-8	Socket Head Capscrew (.3125" - 18 x 1.500")	4
N.S.	379688	Grease Pack.....	1
	329160-22X	Conversion Kit (XD-XR)	
17	28-P-119	Oil Seal, High Pressure	1
19	378849	Retaining Ring.....	1
20	22-P-112	Gasket, Valve Cap	1
23	379746	Retaining Ring.....	1
24	3-P-833	Output Shaft	1
28	28-P-244	O-Ring	2
30	28-P-121	Block -v- Ring	1
34	378576	Retaining Ring.....	1
38	379746	Retaining Ring.....	1
41	21-P-484	Bearing Cap	1
43	378576	Retaining Ring.....	1
44	28-P-225	Oil Seal	1
46	22-P-101	Gasket, Bearing Cap	1
47	378447-8	Socket Head Capscrew (.3125" - 18 x 1.500")	4
N.S.	379688	Grease Pack.....	1
N.S.	328748X	Pump Mounting Kit.....	1
N.S.	378430-11	Hex Capscrew (.3125" - 18 x 1.125")	4
N.S.	378919	Washer.....	4
N.S.	45-P-11	Steel Guide.....	4
	329160-23X	Conversion Kit (XD-XP)	
17	28-P-119	Oil Seal, High Pressure	1
19	378849	Retaining Ring.....	1
20	22-P-112	Gasket, Valve Cap	1
23	379746	Retaining Ring.....	1
24	3-P-832	Output Shaft	1
28	28-P-244	O-Ring	2
30	28-P-121	Block -v- Ring	1
34	378576	Retaining Ring.....	1
38	379746	Retaining Ring.....	1
41	21-P-568	Bearing Cap	1
43	378576	Retaining Ring.....	1
44	28-P-225	Oil Seal.....	1
46	22-P-101	Gasket, Bearing Cap	1
47	378447-8	Socket Head Capscrew (.3125" - 18 x 1.500")	4
N.S.	379688	Grease Pack.....	1

N.S. — Not Shown

Continued on Next Page

Pump Flange Conv. Kits Bills of Materials

Item	Part Number	Description	Quantity
	329160-24X	Conversion Kit (XD-XY)	
17	28-P-119	Oil Seal, High Pressure	1
19	378849	Retaining Ring.....	1
20	22-P-112	Gasket, Valve Cap	1
23	379746	Retaining Ring.....	1
24	3-P-852	Output Shaft	1
28	28-P-244	O-Ring	2
30	28-P-121	Block -v- Ring	1
34	378576	Retaining Ring.....	1
38	379746	Retaining Ring.....	1
41	21-P-524	Bearing Cap	1
43	378576	Retaining Ring.....	1
44	28-P-230	Oil Seal	1
46	22-P-101	Gasket, Bearing Cap	1
47	378447-8	Socket Head Capscrew (.3125" - 18 x 1.500")	4
N.S.	379688	Grease Pack	1
N.S.	378898	Flat Head Socket Screw (.438" - 14 x 1.000")	1
N.S.	379335	Coupling, Splined	1
	329160-25X	Conversion Kit (XD-AF)	
17	28-P-119	Oil Seal, High Pressure	1
19	378849	Retaining Ring.....	1
20	22-P-112	Gasket, Valve Cap	1
23	379746	Retaining Ring.....	1
24	3-P-892	Output Shaft	1
28	28-P-244	O-Ring	2
30	28-P-121	Block -v- Ring	1
34	378576	Retaining Ring.....	1
38	379746	Retaining Ring.....	1
41	21-P-576	Bearing Cap	1
43	378576	Retaining Ring.....	1
44	28-P-225	Oil Seal	1
46	22-P-101	Gasket, Bearing Cap	1
47	378447-8	Socket Head Capscrew (.3125" - 18 x 1.500")	4
N.S.	379688	Grease Pack	1
	329160-35X	Conversion Kit (XR-RA)	
N.S.	21-P-576	Rotatable Pump Flange (Mounts to 21-P-484).....	1
N.S.	378447-6	Socket Head Capscrew (.3125" - 18 x 1.000")	4
	329160-36X	Conversion Kit (XR-RB)	
N.S.	21-P-572	Rotatable Pump Flange (Mounts to 21-P-484).....	1
N.S.	378447-6	Socket Head Capscrew (.3125" - 18 x 1.000")	4

N.S. — Not Shown

Continued on Next Page

Pump Flange Conv. Kits Bills of Materials

Item	Part Number	Description	Quantity
	329160-37X	Conversion Kit (XD-RA)	
17	28-P-119	Oil Seal, High Pressure	1
19	378849	Retaining Ring.....	1
20	22-P-112	Gasket, Valve Cap	1
23	379746	Retaining Ring.....	1
24	3-P-833	Output Shaft	1
28	28-P-244	O-Ring	2
30	28-P-121	Block -v- Ring	1
34	378576	Retaining Ring.....	1
38	379746	Retaining Ring.....	1
41	21-P-484	Bearing Cap	1
N.S.	21-P-628	Pump Flange (Rotatable Flange)	1
43	378576	Retaining Ring.....	1
44	28-P-225	Oil Seal	1
46	22-P-101	Gasket, Bearing Cap	1
47	378447-8	Socket Head Capscrew (.3125" - 18 x 1.500")	4
	378447-6	Socket Head Capscrew (.3125" - 18 x 1.000") (Rotatable Flange).....	4
N.S.	379688	Grease Pack.....	1
N.S.	328748X	Pump Mounting Kit	1
N.S.	378430-11	Hex Capscrew (.3125" - 18 x 1.125")	4
N.S.	378919	Washer	4
N.S.	45-P-11	Steel Guide.....	4
	329160-38X	Conversion Kit (XD-RB)	
17	28-P-119	Oil Seal, High Pressure	1
19	378849	Retaining Ring.....	1
20	22-P-112	Gasket, Valve Cap	1
23	379746	Retaining Ring.....	1
24	3-P-833	Output Shaft	1
28	28-P-244	O-Ring	2
30	28-P-121	Block -v- Ring	1
34	378576	Retaining Ring.....	1
38	379746	Retaining Ring.....	1
41	21-P-484	Bearing Cap	1
N.S.	21-P-572	Pump Flange (Rotatable Flange)	1
43	378576	Retaining Ring.....	1
44	28-P-225	Oil Seal	1
46	22-P-101	Gasket, Bearing Cap	1
47	378447-8	Socket Head Capscrew (.3125" - 18 x 1.500")	4
	378447-6	Socket Head Capscrew (.3125" - 18 x 1.000") (Rotatable Flange).....	4
N.S.	379688	Grease Pack.....	1
N.S.	328748X	Pump Mounting Kit	1
N.S.	378430-11	Hex Capscrew (.3125" - 18 x 1.125")	4
N.S.	378919	Washer	4
N.S.	45-P-11	Steel Guide.....	4

N.S. — Not Shown

Continued on Next Page

Pump Flange Conv. Kits Bills of Materials

Item	Part Number	Description	Quantity
	329160-39X	Conversion Kit (XD-RF)	
17	28-P-119	Oil Seal, High Pressure	1
19	378849	Retaining Ring.....	1
20	22-P-112	Gasket, Valve Cap	1
23	379746	Retaining Ring.....	1
24	3-P-925	Output Shaft	1
28	28-P-244	O-Ring	2
30	28-P-121	Block -v- Ring	1
34	378576	Retaining Ring.....	1
38	379746	Retaining Ring.....	1
41	21-P-484	Bearing Cap	1
N.S.	21-P-628	Pump Flange (Rotatable Flange)	1
43	378576	Retaining Ring.....	1
44	28-P-225	Oil Seal	1
46	22-P-101	Gasket, Bearing Cap	1
47	378447-8	Socket Head Capscrew (.3125" - 18 x 1.500")	4
	378447-6	Socket Head Capscrew (.3125" - 18 x 1.000") (Rotatable Flange).....	4
N.S.	379688	Grease Pack	1
N.S.	328748X	Pump Mounting Kit	1
N.S.	378430-11	Hex Capscrew (.3125" - 18 x 1.125")	4
N.S.	378919	Washer	4
N.S.	45-P-11	Steel Guide.....	4
	329160-45X	Conversion Kit (XD-RG)	
17	28-P-119	Oil Seal, High Pressure	1
19	378849	Retaining Ring.....	1
20	22-P-112	Gasket, Valve Cap	1
23	379746	Retaining Ring.....	1
24	3-P-925	Output Shaft	1
28	28-P-244	O-Ring	2
30	28-P-121	Block -v- Ring	1
34	378576	Retaining Ring.....	1
38	379746	Retaining Ring.....	1
41	21-P-484	Bearing Cap	1
N.S.	21-P-572	Pump Flange (Rotatable Flange)	1
43	378576	Retaining Ring.....	1
44	28-P-225	Oil Seal	1
46	22-P-101	Gasket, Bearing Cap	1
47	378447-8	Socket Head Capscrew (.3125" - 18 x 1.500")	4
	378447-6	Socket Head Capscrew (.3125" - 18 x 1.000") (Rotatable Flange).....	4
N.S.	379688	Grease Pack	1
N.S.	328748X	Pump Mounting Kit	1
N.S.	378430-11	Hex Capscrew (.3125" - 18 x 1.125")	4
N.S.	378919	Washer	4
N.S.	45-P-11	Steel Guide.....	4

N.S. — Not Shown

Continued on Next Page

Pump Flange Conv. Kits Bills of Materials

Item	Part Number	Description	Quantity
	329160-56X	Conversion Kit (XD-PF)	
17	28-P-119	Oil Seal, High Pressure	1
19	378849	Retaining Ring.....	1
20	22-P-112	Gasket, Valve Cap	1
23	379746	Retaining Ring.....	1
24	3-P-925	Output Shaft	1
28	28-P-244	O-Ring	2
30	28-P-121	Block -v- Ring	1
34	378576	Retaining Ring.....	1
38	379746	Retaining Ring.....	1
41	21-P-484	Bearing Cap	1
N.S.	21-P-661	Pump Flange (Rotatable Flange)	1
43	378576	Retaining Ring.....	1
44	28-P-225	Oil Seal	1
46	22-P-101	Gasket, Bearing Cap	1
47	378447-8	Socket Head Capscrew (.3125" - 18 x 1.500")	4
	378447-6	Socket Head Capscrew (.3125" - 18 x 1.000") (Rotatable Flange).....	4
N.S.	379688	Grease Pack.....	1
N.S.	328748X	Pump Mounting Kit.....	1
N.S.	378430-11	Hex Capscrew (.3125" - 18 x 1.125")	4
N.S.	378919	Washer	4
N.S.	45-P-11	Steel Guide.....	4
	329160-57X	Conversion Kit (XD-PA)	
17	28-P-119	Oil Seal, High Pressure	1
19	378849	Retaining Ring.....	1
20	22-P-112	Gasket, Valve Cap	1
23	379746	Retaining Ring.....	1
24	3-P-833	Output Shaft	1
28	28-P-244	O-Ring	2
30	28-P-121	Block -v- Ring	1
34	378576	Retaining Ring.....	1
38	379746	Retaining Ring.....	1
41	21-P-484	Bearing Cap	1
N.S.	21-P-661	Pump Flange (Rotatable Flange)	1
43	378576	Retaining Ring.....	1
44	28-P-225	Oil Seal	1
46	22-P-101	Gasket, Bearing Cap	1
47	378447-8	Socket Head Capscrew (.3125" - 18 x 1.500")	4
	378447-6	Socket Head Capscrew (.3125" - 18 x 1.000") (Rotatable Flange).....	4
N.S.	379688	Grease Pack.....	1
N.S.	328748X	Pump Mounting Kit.....	1
N.S.	378430-11	Hex Capscrew (.3125" - 18 x 1.125")	4
N.S.	378919	Washer	4
N.S.	45-P-11	Steel Guide.....	4
	329160-58X	Conversion Kit (XD-XE)	
	21-P-568	Bearing Cap	1
	22-P-101	Gasket	1
	28-P-225	Oil Seal	1
	378447-8	Socket Head	4
	378576	Lock ring.....	2
	379688	Lubricant.....	1
	22-P-112	Gasket	1
	28-P-244	O-Ring	2
	3-P-1056	Shaft Output	1
	380069	Lock ring.....	1
	379746	Lock ring.....	1

N.S. — Not Shown

Continued on Next Page

Pump Flange Conv. Kits Bills of Materials

Item	Part Number	Description	Quantity
	329160-59X	Conversion Kit (XD-BA)	
	378447-16	Capscrew.....	4
	379977	Pin Spring.....	1
	4-P-186	Spacer.....	1
	28-P-244	O-Ring.....	4
	31-P-113	Washer Spring.....	1
	37-P-60	Spring.....	1
	329410X	Brake Assembly.....	1
	378576	Lock ring.....	3
	550010	Bearing Ball.....	1
	378895	Retaining.....	1
	23-P-68	Spacer.....	1
	21-P-691	Cap Bearing.....	1
	28-P-225	Oil Seal.....	1
	22-P-101	Gasket.....	2
	500007-29	Woodruff Key.....	1
	35-P-74	Gasket Shim PTO to Transmission.....	1
	379958	Instruction.....	1
	380069	Lock ring.....	1
	3-P-1057	Shaft Output.....	1
	329160-66X	Conversion Kit "XD" to "RK"	
	22-P-112	Gasket.....	1
	21-P-759	Cap Bearing.....	1
	21-P-731	Flange Pump.....	1
	22-P-101	Gasket.....	1
	28-P-119	Oil Seal.....	1
	28-P-225	Oil Seal.....	1
	28-P-244	O-Ring.....	2
	378576	Lock ring.....	2
	378849	Lock ring.....	1
	379688	Lubricant.....	1
	378447-8	Socket Head.....	8
	3-P-1051	Shaft Output.....	1
	380069	Lock ring.....	1
	379746	Lock ring.....	1
	329160-67X	Conversion Kit "RK" Dry to "RK" Wet	
	22-P-112	Gasket.....	1
	22-P-101	Gasket.....	1
	28-P-119	Oil Seal.....	1
	28-P-225	Oil Seal.....	1
	28-P-244	O-Ring.....	2
	378576	Lock ring.....	2
	379746	Lock ring.....	2
	378849	Lock ring.....	1
	21-P-722	Cap Bearing.....	1
	378447-8	Socket Head.....	8
	69-P-18	Instruction.....	1
	329700X	Wet Spline.....	1
	329699-1X	Hose Ass'y.....	1
	329658X	Kit Cover.....	1

Continued on Next Page

Pump Flange Conv. Kits Bills of Materials

Item	Part Number	Description	Quantity
	329160-68X	Conversion Kit "XD" to "RK" Wet	
	22-P-112	Gasket	1
	21-P-722	Cap Bearing	1
	21-P-731	Flange Pump	1
	22-P-101	Gasket	1
	28-P-119	Oil Seal	1
	28-P-225	Oil Seal	1
	28-P-244	O-Ring	2
	378576	Lock ring	2
	378849	Lock ring	1
	378447-8	Socket Head	8
	69-P-18	Instruction	1
	329700X	Wet Spline	1
	329699-1X	Hose Ass'y	1
	329658X	Kit Cover	1
	380069	Lock ring	1
	379746	Lock ring	1
	3-P-1051	Shaft Output	1
	329160-69X	Conversion Kit "RA" / "RB" to "RK" Wet	
	22-P-112	Gasket	1
	21-P-722	Cap Bearing	1
	21-P-731	Flange Pump	1
	22-P-101	Gasket	1
	28-P-119	Oil Seal	1
	28-P-225	Oil Seal	1
	28-P-244	O-Ring	2
	378576	Lock ring	2
	378849	Lock ring	1
	378447-8	Socket Head	8
	69-P-18	Instruction	1
	329700X	Wet Spline	1
	329699-1X	Hose Ass'y	1
	329658X	Kit Cover	1
	380069	Lock ring	1
	379746	Lock ring	1
	3-P-1051	Shaft Output	1
	329160-70X	Conversion Kit "RA" / "RB" to "RK" Dry	
	22-P-112	Gasket	1
	21-P-731	Flange Pump	1
	22-P-101	Gasket	1
	28-P-225	Oil Seal	1
	378447-8	Socket Head	8
	21-P-759	Cap Bearing	1
	378576	Lock ring	2
	378849	Lock ring	1
	379688	Lubricant	1
	28-P-119	Oil Seal	1
	28-P-244	O-Ring	2
	380069	Lock ring	1
	379746	Lock ring	1
	3-P-1051	Shaft Output	1

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Pump Flange Conv. Kits Bills of Materials

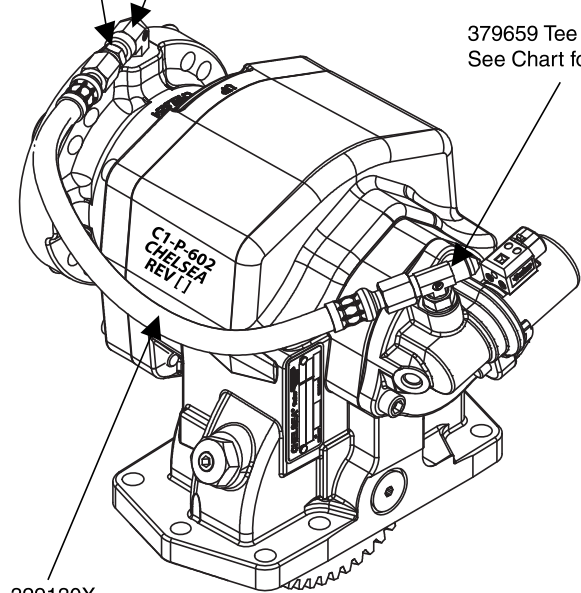
Item	Part Number	Description	Quantity
	329160-71X	Conversion Kit "XD" to "RM" Dry	
	22-P-112	Gasket	1
	21-P-759	Cap Bearing	1
	21-P-731	Flange Pump	1
	22-P-101	Gasket	1
	28-P-119	Oil Seal	1
	28-P-225	Oil Seal	1
	28-P-244	O-Ring	2
	378576	Lock ring	2
	378849	Lock ring	1
	379688	Lubricant.....	1
	378447-8	Socket Head	8
	3-P-1055	Shaft Output	1
	380069	Lock ring	1
	379746	Lock ring	1
	329160-72X	Conversion Kit "XD" to "RM" Wet	
	22-P-112	Gasket	1
	21-P-731	Flange Pump	1
	22-P-101	Gasket	1
	28-P-119	Oil Seal	1
	28-P-225	Oil Seal	1
	28-P-244	O-Ring	2
	378576	Lock ring	2
	378849	Lock ring	1
	378447-8	Socket Head	8
	21-P-722	Cap Bearing	1
	329700X	Wet Spline	1
	329699-1X	Hose Ass'y.....	1
	329658X	Kit Cover	1
	69-P-18	Instruction	1
	3-P-1055	Shaft Output	1
	380069	Lock ring	1
	329160-73X	Conversion Kit "RA" / "RB" to "RM" Dry	
	22-P-112	Gasket	1
	21-P-731	Flange Pump	1
	22-P-101	Gasket	1
	28-P-225	Oil Seal	1
	378447-8	Socket Head	8
	21-P-759	Cap Bearing	1
	378576	Lock ring	2
	378849	Lock ring	1
	379688	Lubricant.....	1
	28-P-119	Oil Seal	1
	28-P-244	O-Ring	2
	380069	Lock ring	1
	379746	Lock ring	1
	3-P-1055	Shaft Output	1

Installation “ZY” Wet Spline 277 & 278 Series (SK-454 Rev A)

379964 Adapter w/Restriction

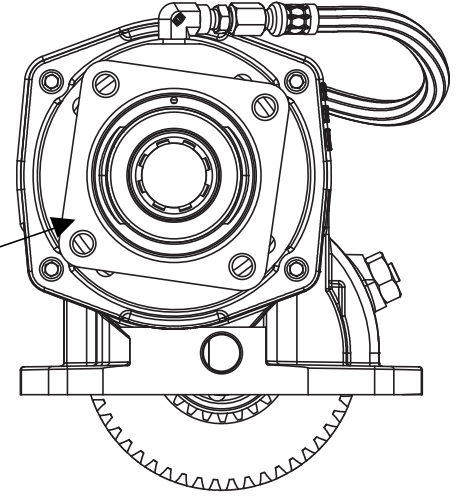
500841-1 90° Elbow

379659 Tee Connect to Transmission Pressure Port
 See Chart for Hose Lengths



329130X
 Lube Hose

Install 22-P-84
 Gasket Between
 PTO and Pump



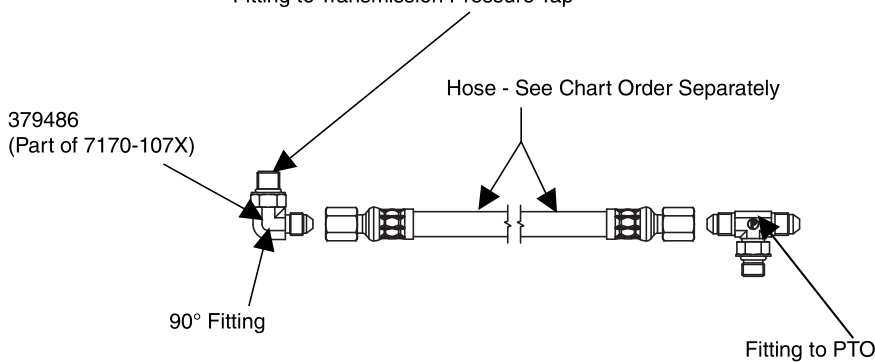
Fitting to Transmission Pressure Tap

Hose - See Chart Order Separately

379486
 (Part of 7170-107X)

90° Fitting

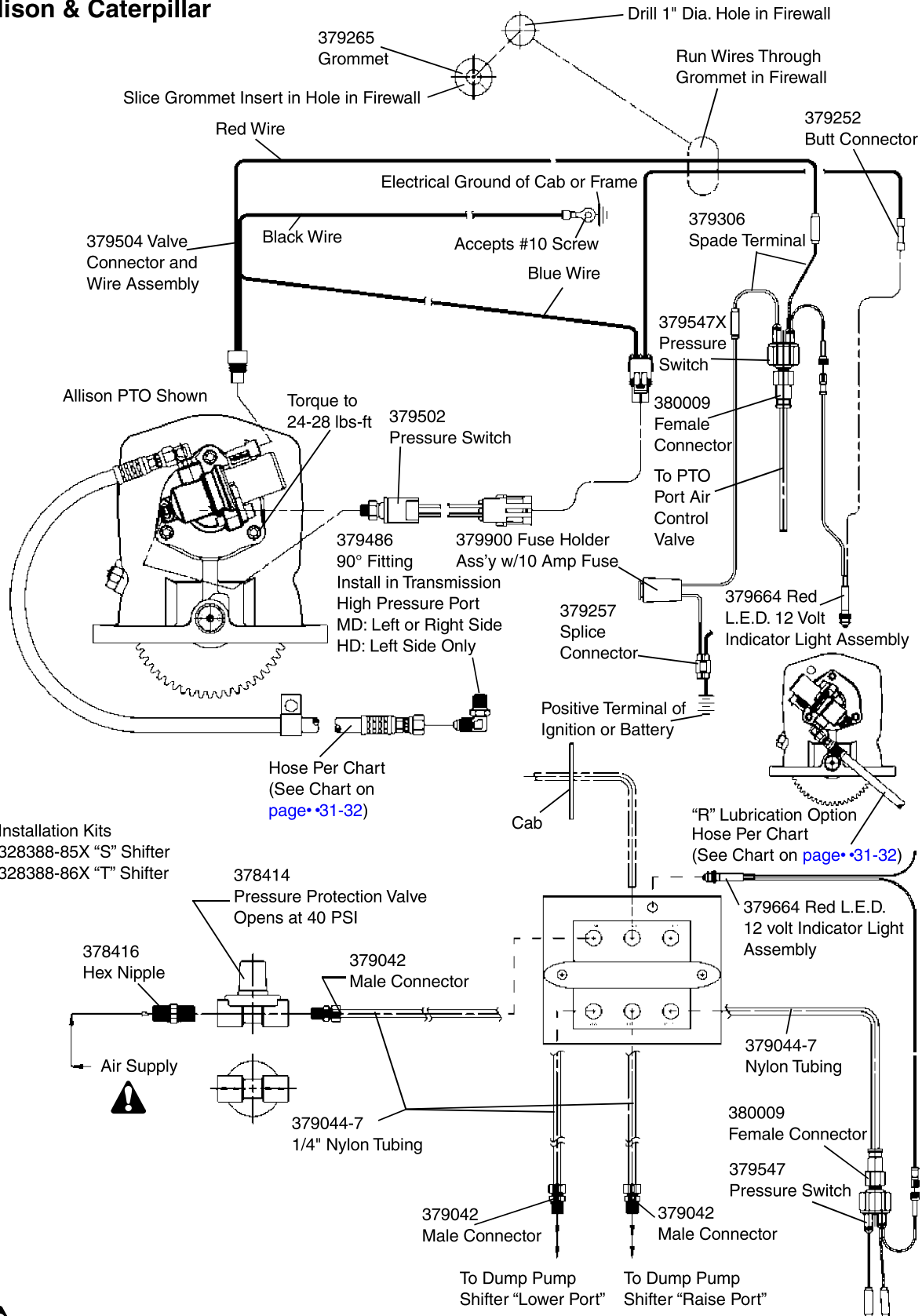
Fitting to PTO



Pressure Hose Chart (Transmission to PTO)

Trans	Location	Hose
MD	Left	329130-5X
MD	Right	329075-1X
HD	Left	329075-4X
HD	Right	329075-2X

PTO Combo Valve Installation Sketch, 277/278 Series (SK-427 Rev C)
Allison & Caterpillar

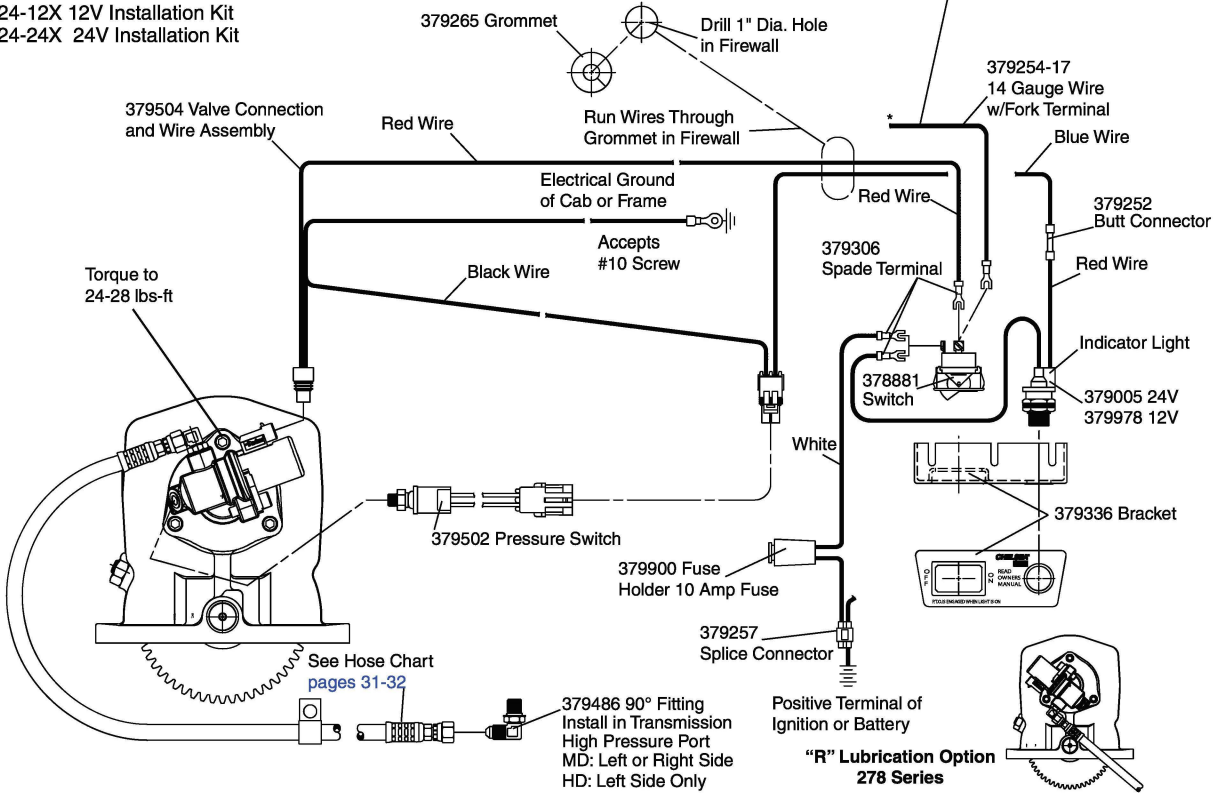


Warning: Connect directly to air supply. Do not use tubing between air supply and pressure protection valve.
Caution: When installing nylon tubing avoid sharp angles, exhaust and manifold systems.

**Shift Installation Kit 277, 278 & 859 Series w/o Electronic Overspeed Control
 (SK-347 Rev E)**

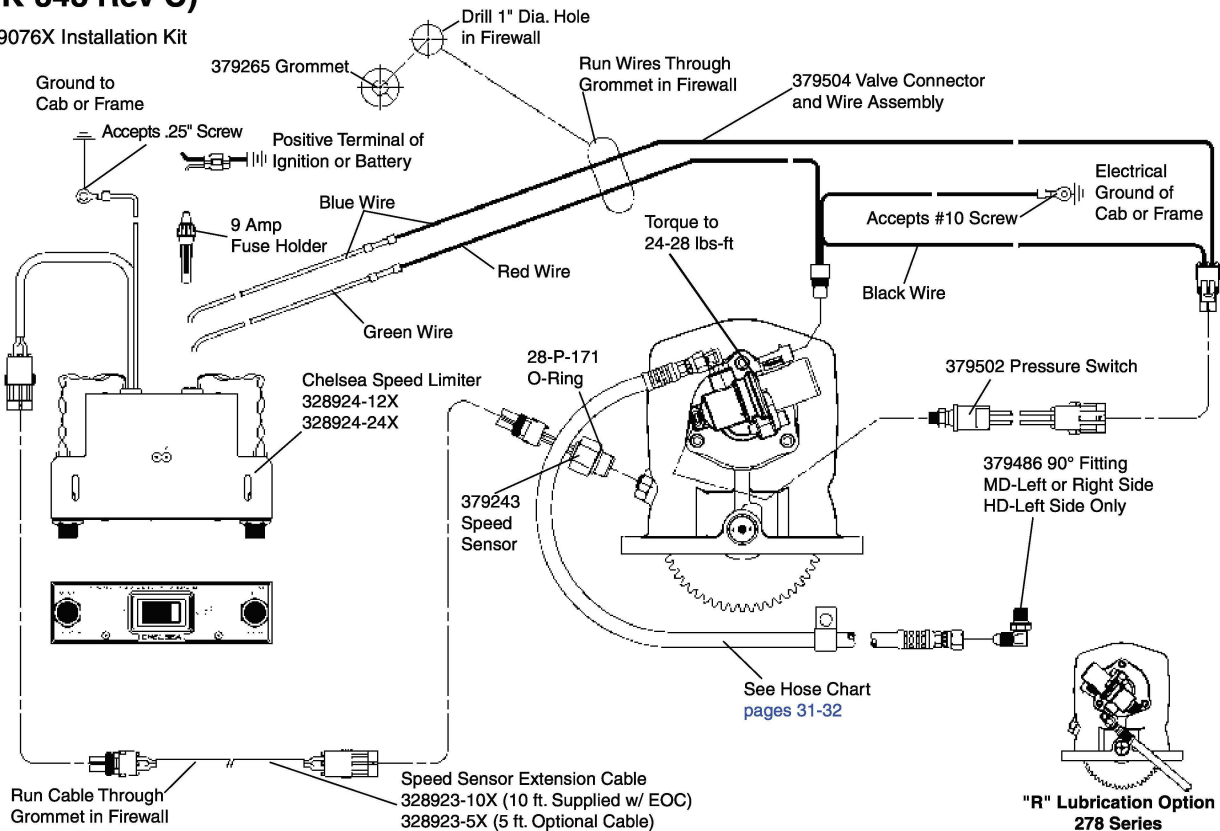
329024-12X 12V Installation Kit
 329024-24X 24V Installation Kit

NOTE: * Pre - 2005-Connect to J1-6 (TCM) or Wire #106
 2005 and Later - Connect to 43 (TCM) or Wire #143.



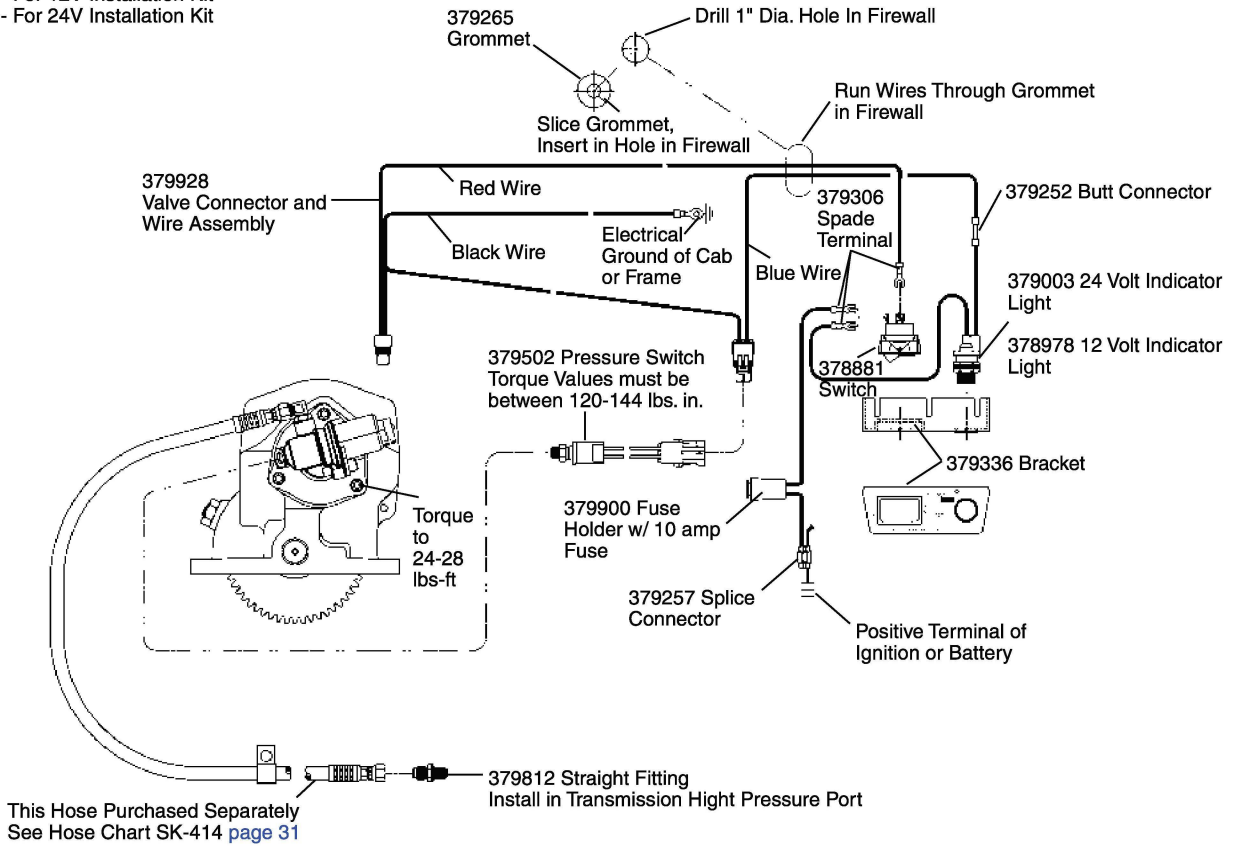
**Shift Installation Kit 277, 278 & 859 Series with Electronic Overspeed Control
 (SK-348 Rev C)**

329076X Installation Kit

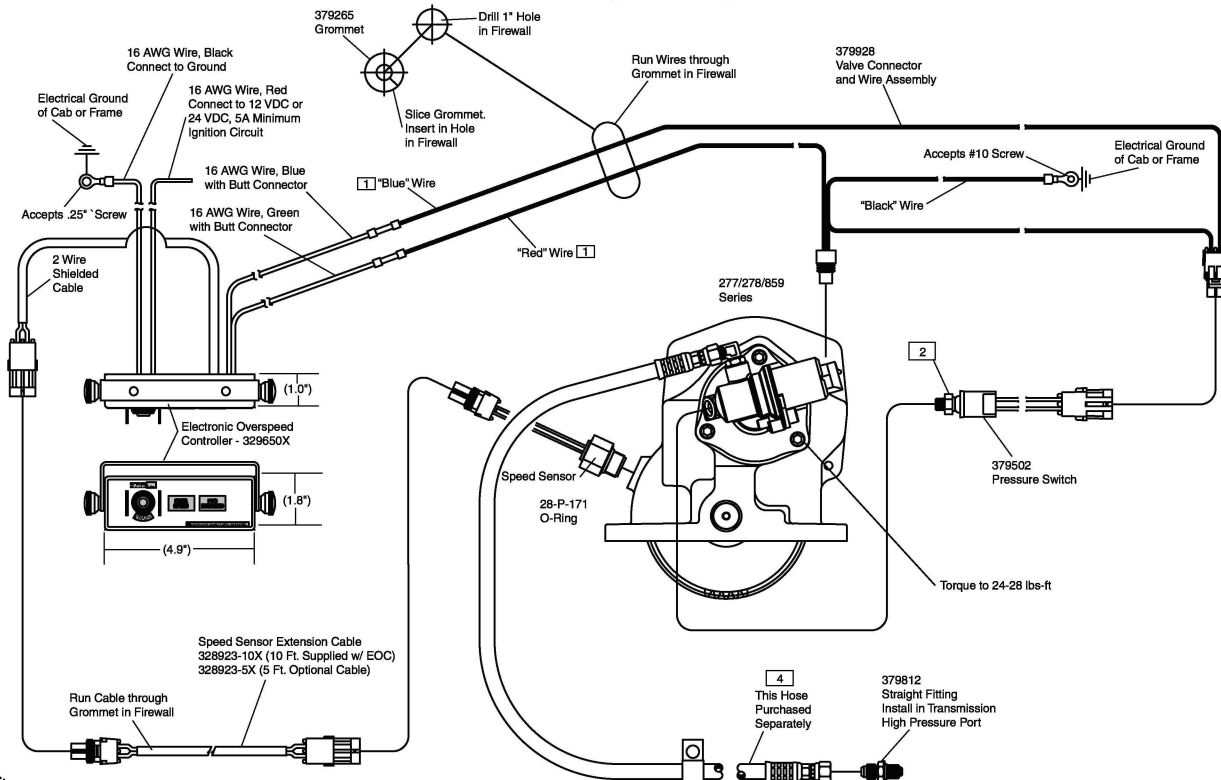


Shift Installation Kit 277/278 Series w/o EOC(SK-411 Rev A) Caterpillar

329443-12X - For 12V Installation Kit
 329443-24X - For 24V Installation Kit



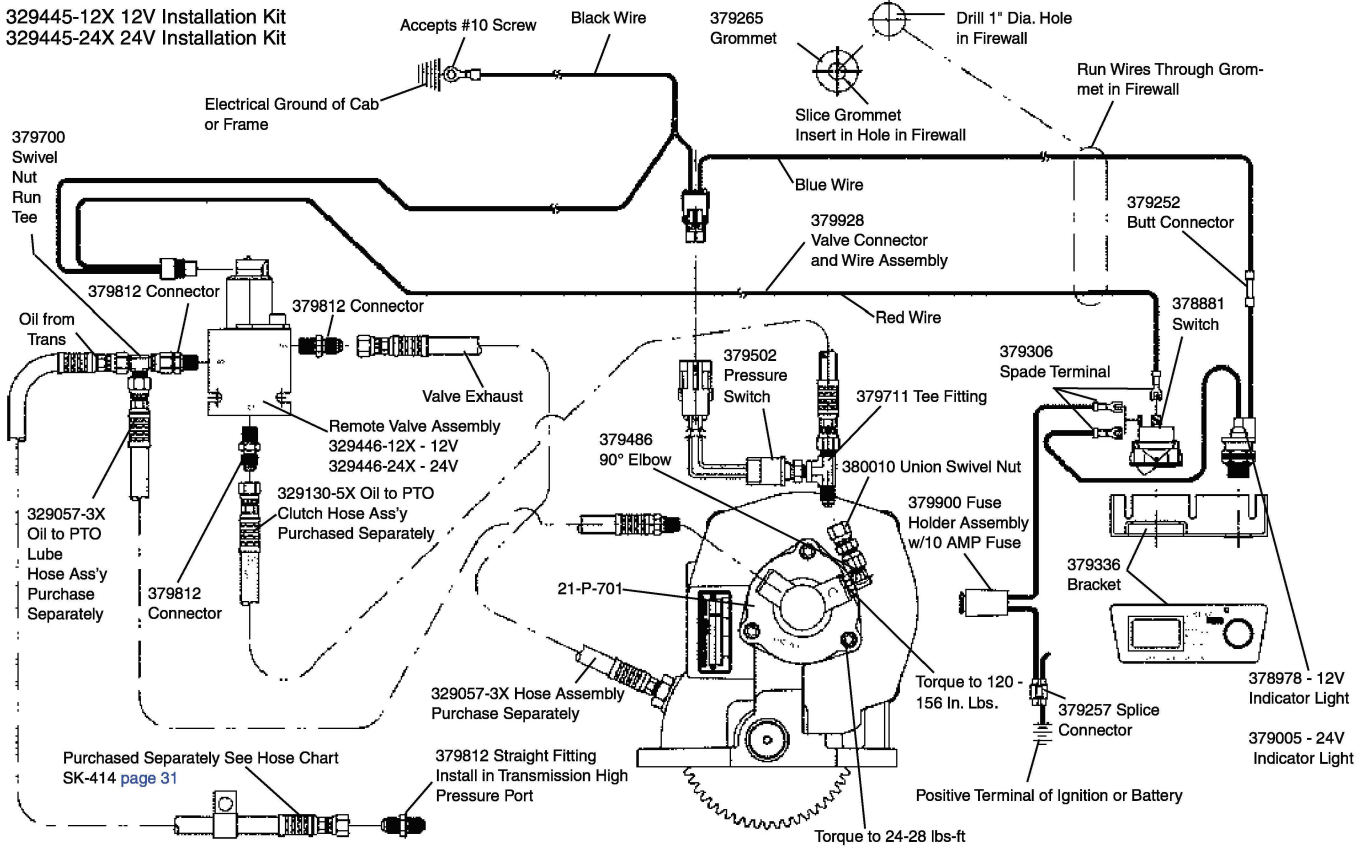
EOC Installation Sketch for 277/278 Series (SK-473) Caterpillar



- NOTES:**
- 1) Strip Wire Ends .25" Prior to Installing in Butt Connector (As Necessary)
 - 2) Caution: Torque Values Must Be Maintained 120-144 Lb In
 - 3) Reference Kit: 329444X Installation Kit
 - 4) See SK-414 For Hose Lengths

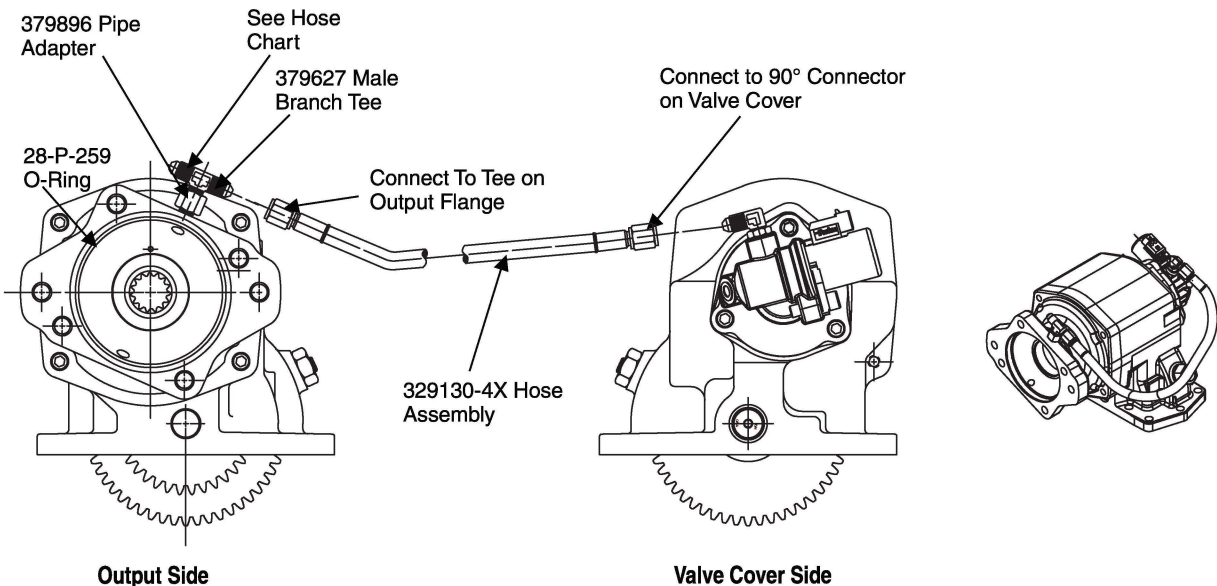
Remote Mount Installation Sketch for 277/278 Series (SK-413 Rev C) Caterpillar

329445-12X 12V Installation Kit
 329445-24X 24V Installation Kit



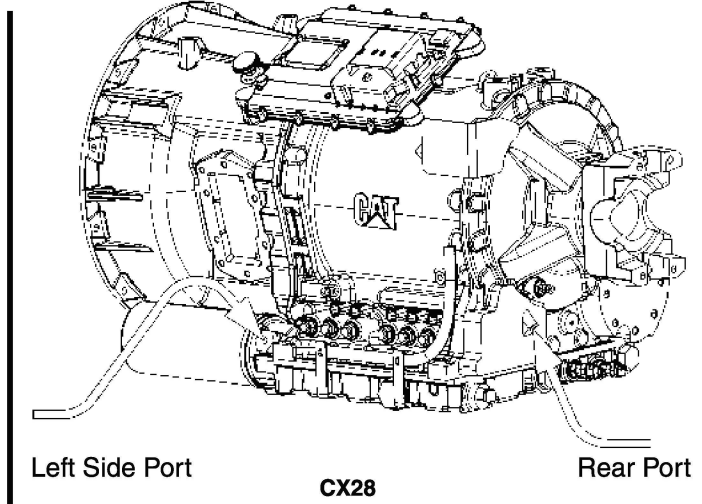
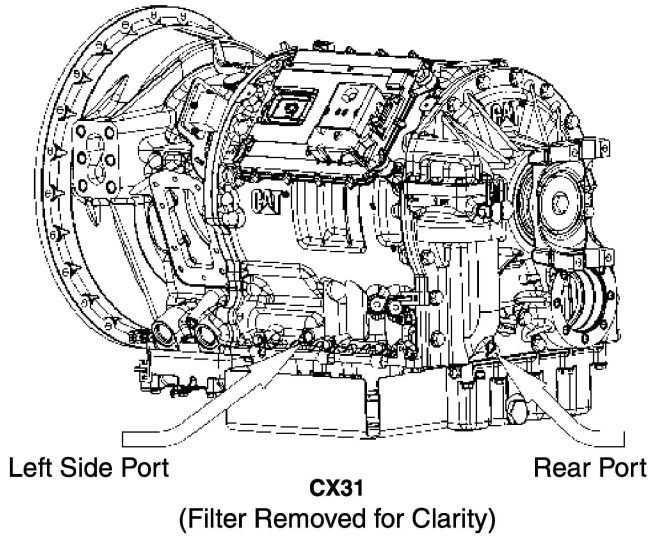
NOTE: This option is not available with, nor can it be used on EOC applications.

Installation "AF" Wet Spline 277/278 Series (SK-383 Rev E) Allison & Caterpillar



Pressure Hose Chart (Transmission to PTO)		
Trans	Location	Hose
MD	Left	329130-1X
MD	Right	329075-1X
HD	Left	329130-1X
HD	Right	329075-2X

Pressure Port Locations & Hose Chart (SK-414 Rev B)



Both High Pressure Connections are -4 O-Ring Boss

HOSE CHART								
Trans.	PTO	PTO Location	High Oil Pressure Location	PTO Valve Location	PTO Fitting	Trans. Fitting	Trans.-PTO Valve Hose #	
CX31 CX28	277, 278, 280, 859, 870	Driver (LHS)	LHS	Attached	379486	379812	329075-1X	
		Driver (LHS)	Rear				329075-5X	
		Pass. (RHS)	LHS			379486	329075-2X	
		Pass. (RHS)	Rear				329075-5X	
		Driver (LHS)	LHS	Remote	379486	379812	329130-6X	
		Driver (LHS)	Rear				329130-6X	
		Pass. (RHS)	LHS				329130-6X	
		Pass. (RHS)	Rear				329130-6X	
	267	Driver (LHS)	LHS	N/A	379486	379812	329130-3X	
		Driver (LHS)	Rear				379486	329075-5X
		Pass. (RHS)	LHS				379812	329075-2X
		Pass. (RHS)	Rear				379812	329075-5X
	867, 877	Driver (LHS)	LHS	N/A	379486	379812	329130-3X	
		Driver (LHS)	Rear				379812	329075-5X
		Pass. (RHS)	LHS				379486	329075-2X
		Pass. (RHS)	Rear				379486	329075-5X

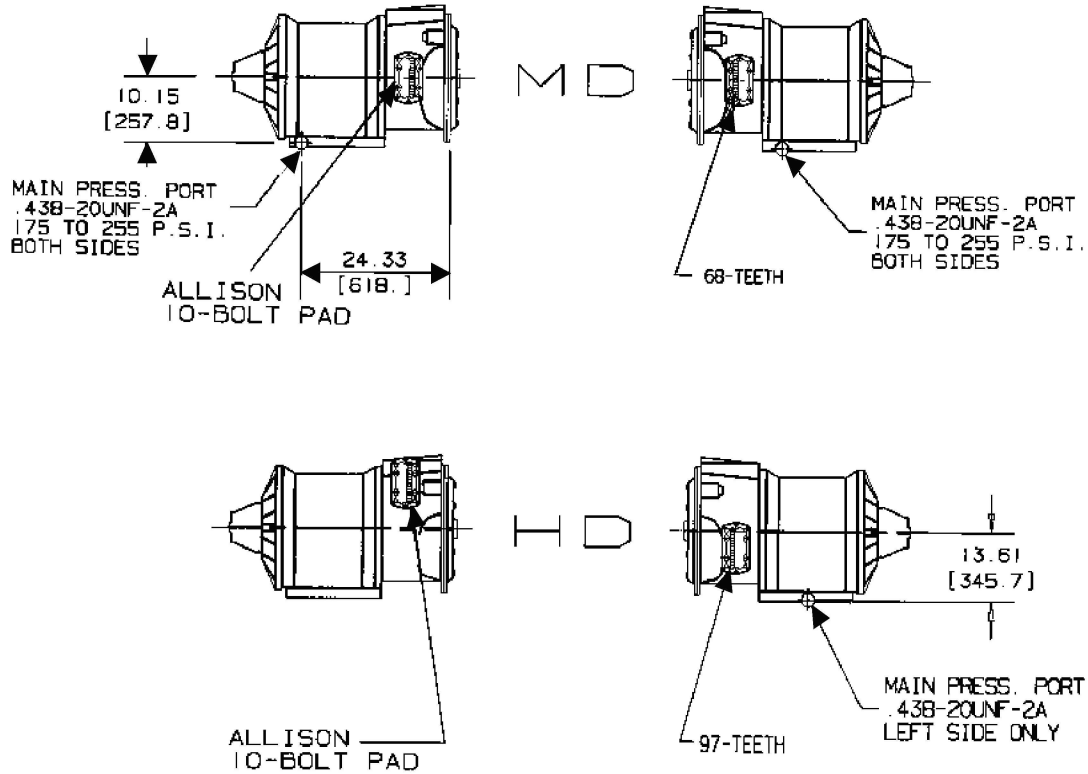
LHS = Left Side of Transmission, 8 o'clock position
 RHS = Right Side of Transmission, 1 o'clock position

NOTES:

1. PTO Fitting 379486 and Transmission Fitting 379812 included with the PTO Unit. If Using 379486 in Transmission it Must be Purchased Separately.
2. Hoses to be Purchased Separately.
3. 379486 Elbow Will Not Install on the CX31 Left Hand (Driver) Side Oil Port Due to Transmission Interference. On CX28, 379486 Elbow will Fit on LHS Port.
4. If 379486 is Listed as Transmission Fitting for Rear Location for CX31. Route Hose Along Right Hand (passenger) Side of Transmission and Under Transmission Output Yoke. For the CX28, Route Hose Under the ECM.

Pressure Port and Aperture Opening Identification

1. These drawings represent left and right views of the MD and HD pressure ports on the transmission.



Hose Specifications by Transmission

TRANS.	LOCATION	277 Series	278 Series
MD	L.H. Side (Left Press. Port)	329130-5X	329130-5X
MD	R.H. Side (Right Press. Port)	329075-1X	329075-1X
HD	Top Right (Left Press. Port)	329075-2X	329075-2X
HD	L.H. Side (Left Press. Port)	329130-4X	329075-4X
HD ^{1,2}	L.H. Side (Left Press. Port)	329130-5X	329130-5X
HD ^{1,2}	Top Right (Right Press. Port)	329130-4X	329075-4X
MD ^{1,2}	L.H. Side (Left Press. Port)	329130-5X	329130-5X
MD ^{1,2}	R.H. Side (Right Press. Port)	329075-1X	329075-1X

An HD with 2 PTO's requires a 379556 "T" fitting and a 379703 swivel nut 90 degree elbow to attach 2 hoses to the single port on the left side.

1 Lubrication Option "R", shifter Options "G" and "H" for 277 Series

2 Lubrication Option "R" for 278 Series

329650X	
328923-10X	Connector Cable (10 Ft).....1
Owner's Manual	HY25-1650-M1/ US1
329448-24X	EOC Conversion Kit 24V
28-P-171	O-Ring1
329650X	Electronic Overspeed Controller.....1
329444X	EOC Wire Installation Kit1
379243	Speed Sensor.....1
329448-12X	EOC Conversion Kit 12V
28-P-171	O-Ring1
329650X	Electronic Overspeed Controller.....1
329444X	EOC Wire Installation Kit1
379243	Speed Sensor.....1
329447-24X	From "H" to "D" 24V
329446-24X	Valve Remote1
379812	Male Connector3
22-P-112	Gasket1
329130-5X	Hose Assembly.....1
329057-3X	Hose Assembly.....2
380010	Union Female1
379700	Tee Female1
379711	Female Bracket.....1
329403X	Assembly Seal.....1
379564-2	Cap Thread.....2
379486	90° Elbow.....1
SK-413	Installation1
329447-12X	From "G" to "B" 12V
329446-12X	Valve Remote1
379812	Male Connector3
22-P-112	Gasket1
329130-5X	Hose Assembly.....1
329057-3X	Hose Assembly.....2
380010	Union Female1
379700	Tee Female1
379711	Female Bracket.....1
329403X	Assembly Seal.....1
379564-2	Cap Thread.....2
379486	90° Elbow.....1
SK-413	Installation1
329445-24X	Valve Remote 24V Installation Kit
329446-24X	Valve Remote1
379812	Male Connector3
379928	Valve Connector1
379900	Assembly Fuse.....1
378881	Rocker Switch.....1
379005	Indicator.....1
379252	Butt Connector.....1
379257	Splice Connector1
379265	Grommet.....1
379306	Fork Connector.....3
379336	Switch Bracket.....1
379502	Pressure Switch.....1
380010	Union Female1
379700	Tee Female1
379711	Female Bracket.....1

329445-12X	Valve Remote 12V Installation Kit
329446-12X	Valve Remote1
379812	Male Connector3
379928	Valve Connector1
379900	Assembly Fuse.....1
378881	Rocker Switch.....1
378978	Indicator.....1
379252	Butt Connector.....1
379257	Splice Connector1
379265	Grommet.....1
379306	Fork Connector.....3
379336	Switch Bracket.....1
379502	Pressure Switch.....1
380010	Union Female1
379700	Tee Female.....1
379711	Female Bracket.....1
329444X	EOC Wire Installation Kit
379252	Butt Connector.....1
379257	Splice Connector1
379265	Grommet.....1
379502	Pressure Switch.....1
379928	Valve Connector1
379061X	Tie Wire1
329443-24X	24V Installation Kit
378881	Rocker Switch.....1
379005	Indicator.....1
379252	Butt Connector.....1
379257	Splice Connector1
379265	Grommet.....1
379306	Fork Connector.....3
379336	Switch Bracket.....1
379502	Pressure Switch.....1
379928	Valve Connector1
379900	Assembly Fuse1
379061X	Tie Wire1
329443-12X	12V Installation Kit
378881	Rocker Switch.....1
378978	Indicator.....1
379252	Butt Connector.....1
379257	Splice Connector1
379265	Grommet.....1
379306	Fork Connector.....3
379336	Switch Bracket.....1
379502	Pressure Switch.....1
379928	Valve Connector1
379900	Assembly Fuse1
379061X	Tie Wire1
329441X	Hino Clearance Kit
379754	Hex Socket1
329130-10X	Hose Assembly.....1
379711	Female Bracket.....1
SK-410	Installation1

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Kits Bill of Materials

**Parts List
277/278 Series**

329403X	Assembly Seal Cap	329240-24X	From "G" to "B" 24V
28-P-119	Oil Seal.....1	500457-6	Mounting Screw.....2
378811	Plate Seal.....1	379686-2	Solenoid Valve.....1
500897-6	Shipping Plug.....2	500357-7	Lock washer.....2
378849	Lock ring.....1	379556	Tee - .438" - 2.....1
21-P-701	Cap Seal.....1	329239X	Seal & Cap.....1
		379258	Bracket.....1
		379449	Screen Adapter.....2
329354-24X	24V Remote Mount	379252	Butt Connector.....2
500457-6	Mounting Screw.....2	329130-1X	Pressure Lube.....2
500357-7	Lock washer.....2	329230X	Connector.....1
379686-2	Solenoid Valve.....1	329231X	Valve Connector.....1
379449	Screen Adapter.....1	328075X	Hose Assembly.....1
379258	Bracket.....1	22-P-112	Gasket.....1
379564-2	Cap Thread.....2		
329231X	Valve Connector.....1	329240-12X	From "B" to "G" 12V
329230X	Connector.....1	329239X	Seal & Cap.....1
328075X	Hose Assembly.....1	379556	Tee - .438" - 2.....1
22-P-112	Gasket.....1	22-P-112	Gasket.....1
379700	Tee Female.....1	328075X	Hose Assembly.....1
380010	Union Female.....1	500457-6	Mounting Screw.....2
379486	90° Elbow.....1	379449	Screen Adapter.....2
329403X	Assembly Seal.....1	379686-1	Solenoid Valve.....1
379711	Female Bracket.....1	500357-7	Lock washer.....2
379131-1	Adapter.....1	329130-1X	Pressure Lube.....2
SK-432	Installation.....1	329230X	Connector.....1
329057-4X	Hose Assembly.....2	329231X	Valve Connector.....1
		379252	Butt Connector.....2
		379258	Bracket.....1
329354-12X	Conversion Kit 278	329237-24X	24V S / Assembly
22-P-112	Gasket.....1	379900	Assembly Fuse.....1
500457-6	Mounting Screw.....2	329230X	Connector.....1
500357-7	Lock washer.....2	329231X	Valve Connector.....1
379686-1	Solenoid Valve.....1	378881	Rocker Switch.....1
379449	Screen Adapter.....1	379005	Indicator.....1
379258	Bracket.....1	379252	Butt Connector.....3
379564-2	Cap Thread.....2	379257	Splice Connector.....1
329231X	Valve Connector.....1	379258	Bracket.....1
329230X	Connector.....1	379265	Grommet.....1
328075X	Hose Assembly.....1	379306	Fork Connector.....3
379700	Tee Female.....1	379336	Switch Bracket.....1
380010	Union Female.....1	379449	Screen Adapter.....1
379486	90° Elbow.....1	379502	Pressure Switch.....1
329403X	Assembly Seal.....1	379686-2	Solenoid Valve.....1
379711	Female Bracket.....1	500357-7	Lock washer.....2
379131-1	Adapter.....1	500457-6	Mounting Screw.....2
SK-432	Installation.....1	379711	Female Bracket.....1
329057-4X	Hose Assembly.....2	379700	Tee Female.....1
		380010	Union Female.....1
		379131-1	Adapter.....1
		SK-432	Installation.....1
329277-1X	Combo 277 Installation Kit		
7170-86X	Mounting / Stud Kit.....1		
329024-12X	12 Volt Shift.....1		
328948-9X	Gasket & Installation Instructions.....1		
329252X	Seal Cap Assembly		
28-P-119	Oil Seal.....1		
21-P-651	Seal Cap.....1		
378811	Plate Seal.....1		
500897-6	Shipping Plug.....1		
500897-5	Shipping Plug.....1		
378849	Lock ring.....1		

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329237-12X	12V S / Assembly	
329230X	Connector.....	1
329231X	Valve Connector.....	1
378881	Rocker Switch.....	1
378978	Indicator.....	1
379252	Butt Connector.....	3
379257	Splice Connector.....	1
379258	Bracket.....	1
379265	Grommet.....	1
379306	Fork Connector.....	3
379336	Switch Bracket.....	1
379449	Screen Adapter.....	1
379502	Pressure Switch.....	1
379686-1	Solenoid Valve.....	1
500357-7	Lock washer.....	2
500457-6	Mounting Screw.....	2
379900	Assembly Fuse.....	1
379711	Female Bracket.....	1
379700	Tee Female.....	1
380010	Union Female.....	1
379131-1	Adapter.....	1
SK-432	Installation.....	1
329175-24X	EOC Conversion Kit	
28-P-171	O-Ring.....	1
329650X	Electronic Overspeed Controller.....	1
329076X	Hydraulic Shift.....	1
379243	Speed Sensor.....	1
329175-12X	EOC Conversion Kit	
28-P-171	O-Ring.....	1
329650X	Electronic Overspeed Controller.....	1
329076X	Hydraulic Shift.....	1
379243	Speed Sensor.....	1
329160-59X	Conversion Kit "XD" to "BA"	
378447-16	Capscrew.....	4
379977	Pin Spring.....	1
4-P-186	Spacer.....	1
28-P-244	O-Ring.....	4
31-P-113	Washer Spring.....	1
37-P-60	Spring.....	1
329410X	Brake Assembly.....	1
378576	Lock ring.....	3
550010	Bearing Ball.....	1
378895	Retaining.....	1
23-P-68	Spacer.....	1
21-P-691	Cap Bearing.....	1
28-P-225	Oil Seal.....	1
22-P-101	Gasket.....	2
500007-29	Woodruff Key.....	1
35-P-74	Gasket Shim PTO to Transmission.....	1
379958	Instruction.....	1
380069	Lock ring.....	1
3-P-1057	Shaft Output.....	1

329076X	Hydraulic Shift	
379252	Butt Connector.....	1
379257	Splice Connector.....	1
379265	Grommet.....	1
379502	Pressure Switch.....	1
379504	Valve Connector.....	1
379254-17	Fork Terminal.....	1
379061X	Tie Wire.....	1
329071-45X	Clutch Repair Kit	
379595	Plate Clutch.....	7
379485	Friction Disc.....	8
28-P-178	O-Ring - 4.4.....	1
380051	Clutch Back-Up Cylinder.....	1
380110X	Piston Clutch.....	1
380110	Piston Clutch.....	1
500566-7	.250 Ball.....	1
329071-43X	Gasket & Seal Kit	
22-P-101	Gasket.....	1
22-P-112	Gasket.....	1
28-P-119	Oil Seal.....	1
28-P-178	O-Ring - 4.4.....	1
28-P-171	O-Ring.....	1
28-P-190	O-Ring - .73.....	1
28-P-191	O-Ring - .54.....	1
28-P-193	Block Ring.....	1
28-P-267	Oil Seal - 2.....	1
28-P-285	O-Ring - 1.5.....	2
28-P-248	O-Ring.....	1
28-P-258	O-Ring.....	1
35-P-74	Gasket Shim.....	1
329071-44X	Bearing Kit	
550311	Ball Bearing.....	1
550439	Tapered Bearing Cone.....	2
560972	Needle Bearing.....	2
14-P-79-1	Washer Bearing.....	1
14-P-79-2	Washer Bearing.....	1
14-P-79-3	Washer Bearing.....	1
14-P-79-4	Washer Bearing.....	1
329071-36X	Bearing Kit	
550010	Bearing Ball.....	1
550439	Tapered Bearing Cone.....	2
560972	Needle Bearing.....	2
14-P-79-1	Washer Bearing.....	1
14-P-79-2	Washer Bearing.....	1
14-P-79-3	Washer Bearing.....	1
14-P-79-4	Washer Bearing.....	1
31-P-102	Thrust Washer.....	1

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Kits Bill of Materials

329071-35X	Bearing Kit for "BA" Output	329043-21X	Service Kit "BA" Brake Section
28-P-244	O-Ring - 1.14	379977	Pin Spring.....1
378576	Lockring.....3	28-P-244	O-Ring - 1.1.....2
378895	Lockring.....1	31-P-113	Washer Spring.....1
28-P-225	Oil Seal.....1	37-P-60	Spring - 2.5.....1
22-P-101	Gasket.....2	329410X	Brake Assembly.....1
35-P-74	Gasket Shim.....1	378576	Lockring.....2
28-P-171	O-Ring.....1	550010	Bearing Ball.....1
28-P-190	O-Ring - .73.....1	21-P-691	Cap Bearing.....1
28-P-191	O-Ring - .54.....1	28-P-225	Oil Seal.....1
28-P-119	Oil Seal.....1	22-P-101	Gasket.....2
28-P-193	Block Ring.....1	35-P-74	Gasket Shim.....1
28-P-178	O-Ring - 4.4.....1		
28-P-121	Block -v- Ring.....1	329024-24X	24 Volt Shift
28-P-248	O-Ring.....1	378881	Rocker Switch.....1
28-P-252	O-Ring - .67.....1	379005	Indicator.....1
28-P-258	O-Ring.....1	379252	Butt Connector.....1
22-P-112	Gasket.....1	379257	Splice Connector.....1
		379265	Grommet.....1
329071-33X	Seal & Gasket Kit	379306	Fork Connector.....3
28-P-244	O-Ring - 1.12	379336	Switch Bracket.....1
35-P-74	Gasket Shim.....1	379502	Pressure Switch.....1
28-P-258	O-Ring.....1	379504	Valve Connector.....1
28-P-248	O-Ring.....1	379900	Assembly Fuse.....1
28-P-191	O-Ring - .54.....1	379254-17	Fork Terminal.....1
28-P-190	O-Ring - .73.....1	379061X	Tie Wire.....1
22-P-101	Gasket.....1		
28-P-193	Block Ring.....1	329024-12X	12 Volt Shift
28-P-119	Oil Seal.....1	378881	Rocker Switch.....1
28-P-171	O-Ring.....1	378978	Indicator.....1
22-P-112	Gasket.....1	379252	Butt Connector.....1
28-P-178	O-Ring - 4.4.....1	379257	Splice Connector.....1
28-P-275	Oil Seal.....1	379265	Grommet.....1
28-P-121	Block -v- Ring.....1	379306	Fork Connector.....3
		379336	Switch Bracket.....1
329071-19X	Gasket & Seal Kit	379502	Pressure Switch.....1
22-P-101	Gasket.....1	379504	Valve Connector.....1
28-P-119	Oil Seal.....1	379900	Assembly Fuse.....1
28-P-171	O-Ring.....1	379254-17	Fork Terminal.....1
28-P-190	O-Ring - .73.....1	379061X	Tie Wire.....1
28-P-191	O-Ring - .54.....1		
28-P-193	Block Ring.....1	328948-9X	Gasket & Installation
28-P-225	Oil Seal.....1	328946X	Caution Label Kit.....1
28-P-244	O-Ring - 1.1.....2	35-P-74	Gasket Shim.....1
28-P-248	O-Ring.....1	379085-2	Instructions Label.....1
28-P-258	O-Ring.....1	379624	Product Warranty Card.....1
35-P-74	Gasket Shim.....1	Owners Manual	HY25-1380-M1/US.....1
22-P-112	Gasket.....1	Safety Guide	HY25-1002-M1/US.....1
28-P-178	O-Ring 4.4.....1		
28-P-121	Block -v- Ring.....1	328924-24X	E.O.C. 24 Volt (Old Style)
		328922-24X	Control Box, Speed Limiter (Old Style)...1
329071-7X	Clutch Repair Kit	379244	Universal Mounting Box.....1
379595	Plate Clutch.....7	328923-10X	Connector Cable (10 Ft).....1
379485	Friction Disc.....8	328931X	Mounting Paret's Bag.....1
329179-1X	Assembly Piston.....1	379260	Caution Tag.....1
28-P-178	O-Ring - 4.4.....1	379266	Owner's Manual.....1
379323-1	Cylinder Clutch.....1	68-P-33-1	Name Plate Spanish.....1
380057-1	Piston Clutch.....1	68-P-33-2	Name Plate French.....1
		379318	Screw Driver.....1

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328924-12X	EOC 12V (Old Style)
328922-12X	Control Box, Speed Limiter (Old Style)...1
379244	Universal Mounting Box.....1
328923-10X	Connector Cable (10 Ft).....1
328931X	Mounting Paret's Bag.....1
379260	Caution Tag.....1
379266	Owner's Manual.....1
68-P-33-1	Name Plate Spanish.....1
68-P-33-2	Name Plate French.....1
379318	Screw Driver.....1

328748X	Pump Mounting Kit
378430-11	Hex Capscrew4
378919	Washer4
45-P-11	Steel Guide.....4

328388-86X	Air / Hydraulic T Shift Kit 277/278
SK-427	Installation1
378416	Hex Nipple1
379042	Male Connector3
379044-6	Nylon Tubing.....1
329316X	Valve Assembly1
380009	Connector.....1
378414	Pressure Protection Valve1
379252	Butt Connector.....1
379257	Splice Connector.....1
379265	Grommet.....1
379502	Pressure Switch.....1
379504	Valve Connector1
379900	Assembly Fuse.....1
379665-1	Decal S & T Options.....1
379547X	Pressure Switch.....1
379061X	Tie Wire1

328388-85X	Air / Hydraulic S Shift Kit 277/278
SK-427	Installation1
378416	Hex Nipple1
379042	Male Connector3
379044-6	Nylon Tubing.....1
329214X	Assembly Air Supply.....1
380009	Connector.....1
378414	Pressure Protection Valve1
379252	Butt Connector.....1
379257	Splice Connector.....1
379265	Grommet.....1
379502	Pressure Switch.....1
379504	Valve Connector1
379900	Assembly Fuse.....1
379665-1	Decal S & T Options.....1
379547X	Pressure Switch.....1
379061X	Tie Wire1

7170-86X	Mounting / Stud Kit
379451	Screw Pilot.....2
379453-10	Capscrew M10 - 1.5" x 1.378"8
379486	90° Elbow.....1
SK-355	Installation1

7170-107X	Mounting Parts Bag Kit
379451	Screw Pilot.....2
SK-355	Installation1
379453-8	Capscrew M10 - 1.5" x 1.181"2
379486	90° Elbow.....1
379453-10	Capscrew M10 - 1.5" x 1.378"8

7170-117X	Mounting / Stud Kit
379451	Screw Pilot.....2
379453-10	Capscrew M10 - 1.5" x 1.378"8
379812	Male Connector1

7170-118X	Mounting / Stud Kit
379451	Screw Pilot.....2
SK-355	Installation1
379453-8	Capscrew M10 - 1.5" x 1.181"2
379812	Male Connector1
379453-10	Capscrew M10 - 1.5" x 1.378"8

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13. Limitation on Assignment. Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller.

14. Force Majeure. Seller does not assume the risk and shall not be liable for delay or failure to perform any of Seller's obligations by reason of circumstances beyond the reasonable control of Seller (hereinafter "Events of Force Majeure"). Events of Force Majeure shall include without limitation: accidents, strikes or labor disputes, acts of any government or government agency, acts of nature, delays or failures in delivery from carriers or suppliers, shortages of materials, or any other cause beyond Seller's reasonable control.

15. Waiver and Severability. Failure to enforce any provision of this agreement will not waive that provision nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidation of any provision of this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full force and effect.

16. Termination. Seller may terminate this agreement for any reason and at any time by giving Buyer thirty (30) days written notice of termination. Seller may immediately terminate this agreement, in writing, if Buyer: (a) commits a breach of any provision of this agreement (b) appoints a trustee, receiver or custodian for all or any part of Buyer's property (c) files a petition for relief in bankruptcy on its own behalf, or by a third party (d) makes an assignment for the benefit of creditors, or (e) dissolves or liquidates all or a majority of its assets.

17. Governing Law. This agreement and the sale and delivery of all Products hereunder shall be deemed to have taken place in and shall be governed and construed in accordance with the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to this agreement.

18. Indemnity for Infringement of Intellectual Property Rights. Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets ("Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that a Product sold pursuant to this Agreement infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If a Product is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Product, replace or modify the Product so as to make it noninfringing, or offer to accept return of the Product and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The foregoing provisions of this Section shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

19. Entire Agreement. This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of sale. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged.

20. Compliance with Law, U. K. Bribery Act and U.S. Foreign Corrupt Practices Act. Buyer agrees to comply with all applicable laws and regulations, including both those of the United Kingdom and the United States of America, and of the country or countries of the Territory in which Buyer may operate, including without limitation the U. K. Bribery Act, the U.S. Foreign Corrupt Practices Act ("FCPA") and the U.S. Anti-Kickback Act (the "Anti-Kickback Act"), and agrees to indemnify and hold harmless Seller from the consequences of any violation of such provisions by Buyer, its employees or agents. Buyer acknowledges that they are familiar with the provisions of the U. K. Bribery Act, the FCPA and the Anti-Kickback Act, and certifies that Buyer will adhere to the requirements thereof. In particular, Buyer represents and agrees that Buyer shall not make any payment or give anything of value, directly or indirectly to any governmental official, any foreign political party or official thereof, any candidate for foreign political office, or any commercial entity or person, for the purpose of influencing such person to purchase products or otherwise benefit the business of Seller.

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